



MPC

Operating Instructions

Motor Purge Control System for Ex II 2G/3G

Motor Purge Controller (MPC) Control Unit

Type 2G: 07-3711-6210/.M..; Type 3G: A7-3711-6110/.M..

MPV Pressure Monitor Module Type 17-51P3-3.03

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MPV Pressure Monitor Module
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1 Safety

1.1 This Manual

Operating Instructions











It is essential to read and observe the contents of this documentation and this chapter in particular before you install and operate the Motor Purge Control System.

This manual contains the information necessary for using the control unit in accordance with the intended purpose. It is addressed to technically qualified personnel.

Familiarity with and the technically perfect implementation of the safety instructions and warnings described in this manual are preconditions for safe installation and commissioning. The safety notes and warnings given in this documentation are given in a general way and only qualified personnel will have the necessary specialised know-how to interpret and implement them correctly in specific cases.

This manual is an integral part of the scope of supply even if for logistical reasons it can be ordered and delivered separately. If you need any further information, please ask the BARTEC branch that is near you or responsible for your area.

Particularly important points in this documentation are marked with a warning symbol:

 DANGER	
	DANGER draws attention to a danger which will lead to death or serious injury if not avoided.
 WARNING	
	WARNING draws attention to a danger which can lead to death or serious injury if it is not avoided.
 CAUTION	
	CAUTION draws attention to a danger which can lead to an injury if it is not avoided.
ATTENTION	
ATTENTION draws attention to measures to be taken to prevent damage to property.	
 Note	
	Important instructions and information on effective, economical and environmentally compatible handling.

1.1.1 Languages

Note



The original operating instructions were written in German. All other available languages are translations of the original operating instructions.

The operating instructions are available in various languages. They are enclosed with the product in the languages German and English. Additional languages are available in French, Italian, Spanish and Russian on request.

If you require any other languages, please ask BARTEC or request them when placing the order.

1.2 Handling the Product

The product described in these operating instructions has been tested and left the factory in perfect condition as regards meeting safety requirements. To maintain this condition and ensure that this product operates perfectly and safely, it may be used only in the manner described by the manufacturer. Appropriate transportation, suitable storage and careful operation are also essential for the perfect and safe operation of this product.

The Motor Purge Control System must be mounted properly and securely onto the pressurized enclosure if it is to work perfectly and correctly.

1.3 Use in Accordance with the Intended Purpose

1.3.1 Use Exclusively for the Intended Purpose

The Motor Purge Control System serves exclusively as a controlling and monitoring device for pressurized enclosures and is intended for use in Explosion Group II, Category 2G or 3G and Temperature class T4. The permissible operating data for the device being used must be observed.

1.3.2 Improper Use

Any other use is not in accordance with the intended purpose and can cause damage and accidents. The manufacturer will not be liable for any use beyond that of its exclusive intended purpose.

1.4 Owner's/Managing Operator's Obligations

The owner/managing operator undertakes to restrict permission to work with the Motor Purge Control System to people who:

- are familiar with the basic regulations on safety and accident prevention and have been instructed in the use of the Motor Purge Control System;
- have read and understood the documentation, the chapter on safety and the warnings.
- The owner/managing operator must check that the safety regulations and accident prevention rules valid for the respective application are being observed.

1.5 Safety Instructions

1.5.1 General Safety Instructions

- Take the device out of the hazardous area before wiping it with a dry cloth or cleaning it!
- Do not open devices in a hazardous area.
- The general statutory regulations or directives relating to safety at work, accident prevention and environmental protection legislation must be observed, e.g. the German industrial health and safety ordinance (BetrSichV) or the applicable national ordinances.
- In view of the risk of dangerous electrostatic charging, wear appropriate clothing and footwear.
- Avoid the influence of heat that is higher or lower than the specified temperature range. (see chapter 9 "Technical Data").
- Keep the devices away from moisture.

1.5.2 Safety Instructions for Operation

When setting up or operating explosion-resistant electrical systems, the IEC/EN 60079-14 (NEC for USA/CEC for Canada) and all relevant installation and operating regulations must be observed.

Upkeep

- For electrical systems the relevant installation and operating regulations must be complied with (e.g. Directive 99/92/EC, Directive 94/9/EC, German industrial health and safety ordinance (BetrSichV), the applicable national ordinances IEC 60079-14 and the DIN VDE 0100 series)!
- Observe the national waste disposal regulations when disposing of the device.

Maintenance

- Regular servicing is not necessary if the equipment is operated correctly in accordance with the installation instructions and environmental conditions (see chapter 8 "Maintenance and Care").

Inspection

- Under IEC 60079-19 and EN 60079-17, the owner/managing operator of electrical installations in hazardous areas is obliged to have these installations checked by a qualified electrician to ensure that they are in a proper condition.

Repairs

- Repairs on explosion-protected operating equipment may be done only by authorized persons working in accordance with the latest developments in technology and using original spare parts. The applicable regulations must be observed.

Commissioning

- Before commissioning, check that all components and documents are there.

1.6 Standards Adhered To

The Motor Purge Control System conforms to Directive 94/9/EC for devices and protective systems for their use to the intended purpose in hazardous areas (ATEX Directive). Pursuant to this directive, the following standards serve as a basis for the Motor Purge Control System:

1.6.1 Motor Purge Control System MPC 2G

Standard	Designation
EN 60079-0:2012 IEC60079:2011	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
EN 60079-1:2007 IEC 60079-1:2007-04	Explosive Atmospheres - Part 1: Equipment protection by flameproof enclosure "d"
EN 60079-2:2007 IEC 60079-2:2007-02	Explosive Atmospheres - Part 2: Equipment protection by pressurized enclosure "p"
EN 60079-7:2007 IEC 60079-7:2006-07	Explosive Atmospheres - Part 7: Equipment protection by increased safety "e"
EN 60079-11:2012 IEC 60079-11:2011	Explosive Atmospheres - Part 11: Equipment protection by intrinsic safety "i"
EN 60079-26:2007 IEC60079-26:2006	Explosive atmospheres - Part 26: Equipment with Equipment Protection Level (EPL) Ga
DIN EN ISO 61511-1:2005	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and software requirements
DIN EN ISO 61511-2:2005	Functional safety - Safety instrumented systems for the process industry sector - Part 2: Guidelines for the application of part 1
EN 61000-6-2:2005 IEC 61000-6-2:2005	Electromagnetic Compatibility (EMC) - Part 6-2: Generic standards - Immunity for Industrial environments
EN 61000-6-4:2007 + A1:2011 IEC 61000-6-4:2006 + A1:2010	Electromagnetic Compatibility (EMC) – Part 6-4: Generic Standards - Emission standard for industrial environments
EN 60529:1991 + A1:2000 IEC 60529:1989 + A1:2000	Safety requirements for electrical equipment for measurement, control and laboratory use
EN 60079-0:2012 IEC60079:2011	Degrees of protection provided by enclosures (IP code)

1.6.2 Motor Purge Control System MPC 3G



Standard	Designation
EN 60079-0:2012	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
EN 60079-2:2007	Explosive Atmospheres - Part 2: Equipment protection by pressurized enclosure "p"
EN 60079-11:2011	Explosive Atmospheres - Part 11: Equipment protection by intrinsic safety "i"
EN 60079-15:2005	Electrical apparatus for explosive gas atmospheres - Part 15: Construction, test and marking of type of protection "n" electrical apparatus
EN 61000-6-2:2005	Electromagnetic Compatibility (EMC) - Part 6-2: Generic standards - Immunity for Industrial environments
EN 61000-6-4:2007 + A1:2011	Electromagnetic Compatibility (EMC) - Part 6-4: Generic Standards - Emission standard for industrial environments
EN 60529:1991 + A1:2000	Degrees of protection provided by enclosures (IP code)

1.7 Ex Protection Type Marking and Certification

The following markings showing Ex protection and certification are affixed to the device:

Motor Purge Control System Category 2G (ATEX)	
Ⓔ II 2(1) G Ex d e ib [ia Ga px] IIC T4 Gb	DMT 99 ATEX E 082
Motor Purge Control System Category 2G (IEC)	
Ex d e ib [ia Ga px] IIC T4 Gb	IECEX BVS 13.0039
Motor Purge Control System Category 3G (ATEX)	
Ⓔ II 3G Ex nA nC [ic pz] IIC T4 Gc	

1.8 Warranty

⚠ WARNING	
	<p>Risk of death or serious injury if the Motor Purge Control System is modified or converted without the manufacturer's approval.</p> <p>It can then no longer be assured that the design and production will provide explosion protection, stress tolerance and conformance to safety requirements.</p> <ul style="list-style-type: none"> ➤ Before making any modifications or implementing any conversions, contact the manufacturer and obtain written approval. ➤ Use only original spare parts and original expendable parts.
📘 Note	
	<p>Scope of warranty</p> <p>The manufacturer grants a complete guarantee only and exclusively for the spare parts ordered from the manufacturer.</p>

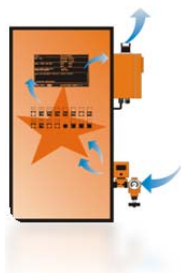
As a basic rule, our "General conditions of sale and Delivery" apply. These are available to the owner/managing operator at the latest on formation of a contract. Guarantee and liability claims for personal injury and damage to property are excluded if they are due to one or more of the following reasons:

- use of the Motor Purge Control System for a purpose other than that for which it is intended.
- incorrect installation, commissioning, operation and maintenance of the Motor Purge Control System.
- non-compliance with the instructions in the manual with respect to transport, storage, assembly, commissioning, operation and maintenance
- unauthorized structural modifications of the Motor Purge Control System
- inadequate monitoring of parts that are subject to wear
- repairs done incorrectly.
- disasters due to the effects of foreign matter or Act of God (events outside human control).

We guarantee the Motor Purge Control System and its accessories for a period of 1 year starting on the date of delivery from the Bad Mergentheim factory. This guarantee covers all parts of the delivery and is restricted to the replacement free of charge or the repair of the defective parts in our Bad Mergentheim factory. As far as possible, the delivery packaging should be kept for this purpose. In the event of such a claim, the goods must be returned to us after written arrangement. The customer cannot claim to have the repairs done at the site of installation.

2 Product Description

2.1 General Information about “Pressurized Enclosure” Type of Protection



The Ex p type of protection, referred to as “pressurized enclosure”, is based on the measure of purging out any explosive gases that are in a closed enclosure and then generating and maintaining a level of pressure that is higher than that of the ambient atmosphere.

As the pressure inside the cabinet is higher than the atmospheric pressure, it is not possible at any time for explosive gases to penetrate the inside of the enclosure. This creates an Ex-free area in which electrical devices that are not themselves explosion-proof can be mounted and operated.

The Motor Purge Control System described in these operating instructions functions in “pressurized enclosure with leakage loss compensation” technology. Specifically this means that the positive pressure in an enclosure is maintained by the subsequent feeding of purge gas to compensate for the leakages from the enclosure.

To ensure that an explosive atmosphere that has penetrated during downtimes cannot become a danger, the enclosure must be flushed with purge gas (compressed air or inert gas) before it is commissioned. The quantity is decided on the basis of the inspection during first-time operation. The rate of flow is measured or determined at the pressurized enclosure’s outlet.

Since a safe condition in the enclosure is not reached until the operating phase is started, the Motor Purge Control System with its system components, such as sensor module, control module and pressure monitor and the purge gas valve are produced in explosion-proof versions.

2.2 Motor Purge Control System



The motor purge control system, which has its own certification, is a system for producing pressurization for motors. It consists of a motor purge controller und a motor purge valve.

The purge gas circuit and the actual Ex p control unit are mounted inside the motor purge controller.

The corresponding motor purge valve is required to ensure the Ex p motor is purged properly and in a controlled fashion.

2.3 System Components

2.3.1 Motor Purge Controller

The Motor Purge Controller with its system components serves as an automatic control for pressurizing enclosures in the hazardous areas of Zones 1 and 2.

The Motor Purge Controller is suitable for all standard applications in the field of pressurized enclosures larger than 180 m³/h. The electrical installed parts inside the pressurized enclosure are enabled by the Motor Purge Controller directly or by an additional switching device.

Once the Motor Purge Controller has been mounted on the pressurized enclosure and the mains voltage and purge gas have been connected, the pressurized system starts automatically. The Motor Purge Controller regulates the purge gas flow and the pressure inside the enclosure during the purging phase.

When the operating phase is initiated, the components mounted in the pressurized enclosures are automatically activated by the Motor Purge Controller. The pressure inside the pressurized enclosure is maintained automatically during the operating phase and any leakage losses are compensated. The optional heating and / or cooling are fully functional even when the Motor Purge Control System is switched off.

2.3.1.1 Standard Version



Displays: pressure display, “operate display” indicator lamp, “purging display” indicator lamp

Ex zone: 1 or 2

Enclosure material: sheet steel, painted, RAL 7035

Ambient temperature: -20 °C up to +40 °C

2.3.1.2 With an extended ambient temperature range



Displays: pressure display, “operate display” indicator lamp, “purging display” indicator lamp

Ex Zone: 1 or 2

Enclosure material: sheet steel, painted, RAL 7035

Ambient temperature: -20 °C up to +45 °C

2.3.1.3 With a High Ambient Temperature Range



Displays: operate display” indicator lamp, “purging display” indicator lamp

Ex Zone: 1 or 2

Enclosure material: polyester, antistatic, insulated

Ambient temperature: -30 °C up to +50 °C

2.3.2 Motor Purge Valve

For the purposes of flow measurement, the motor purge valve is connected to the motor purge controller by means of measuring lines.

Furthermore, during the purging operation, the motor purge valve opens the purging circuit automatically by means of a pneumatic valve.

The motor purge valve is provided with a flying spark barrier to ensure that no glowing particles can escape from the Ex p area into the ambient atmosphere.



Flying spark and particle barrier: integrated

Sizes: MPV 2 and MPV 3

Enclosure material: sheet steel, painted, RAL 7035

2.3.3 Accessories

2.3.3.1 Manual Leakage Loss Compensation

Ex p motors which have an increased leakage loss can have a manual leakage loss compensator retrofitted. This compensates for the base levels of air leakage from the Ex p motor. Peak levels are compensated by means of the proportional valve which is integrated in the MPC.

This is connected parallel to the purging air inlet and outlet on the motor purge controller.

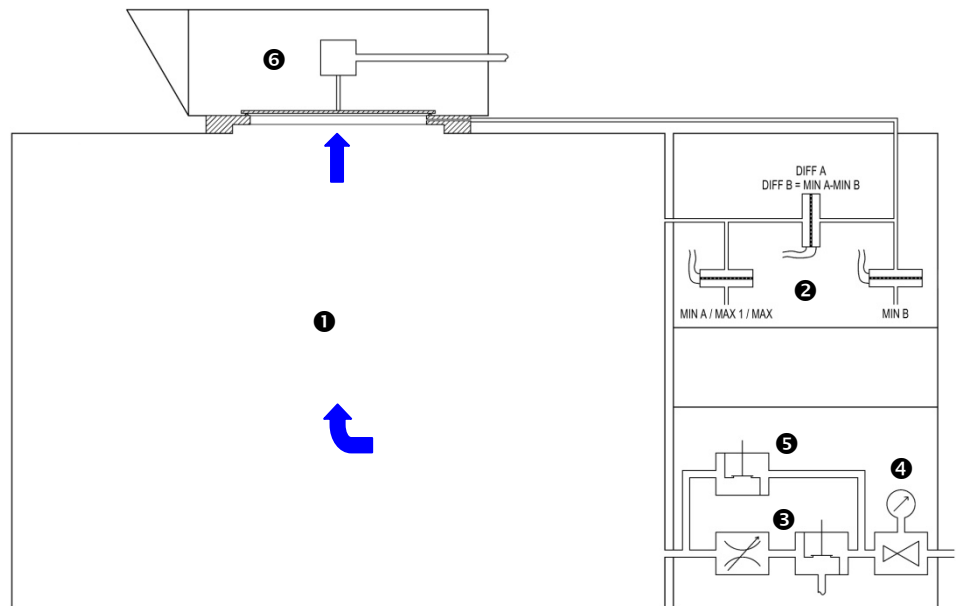



Setting: chokes

Increase: 0-180 m³

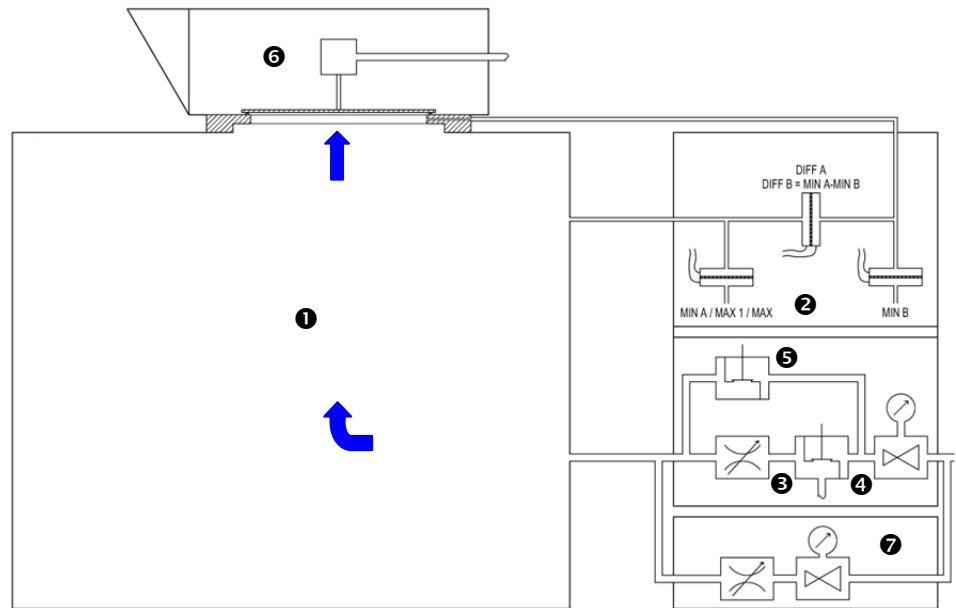
Enclosure material: sheet steel, painted, RAL 7035


2.4 Schematic Diagram of a Motor Purge Control System - Standard



Position	Designation
	Purge gas flow
①	Pressurized enclosure (Ex p motor)
②	MPC Motor Purge Controller consisting of the components:
	<ul style="list-style-type: none"> • sensor module with display and pressure measurement • control module
③	Purge gas valve with purge gas nozzle (purge flow restriction)
④	Pressure reducer with pressure gauge
⑤	Valve for leakage compensation
⑥	MPV Motor Purge valve with orifice, Outlet valve and spark barrier


2.5 Schematic Diagram of a Motor Purge Control System - with Manual Leakage Loss Compensation



Position	Designation
	Purge gas flow
①	Pressurized enclosure (Ex p motor)
②	MPC Motor Purge Controller consisting of the components:
	<ul style="list-style-type: none"> • sensor module with display and pressure measurement • control module
③	Purge gas valve with purge gas nozzle (purge flow restriction)
④	Pressure reducer with pressure gauge
⑤	Valve for leakage compensation
⑥	MPV Motor Purge valve with orifice, outlet valve and spark barrier
⑦	Optional: manual leakage loss compensation with pressure reducer and choke

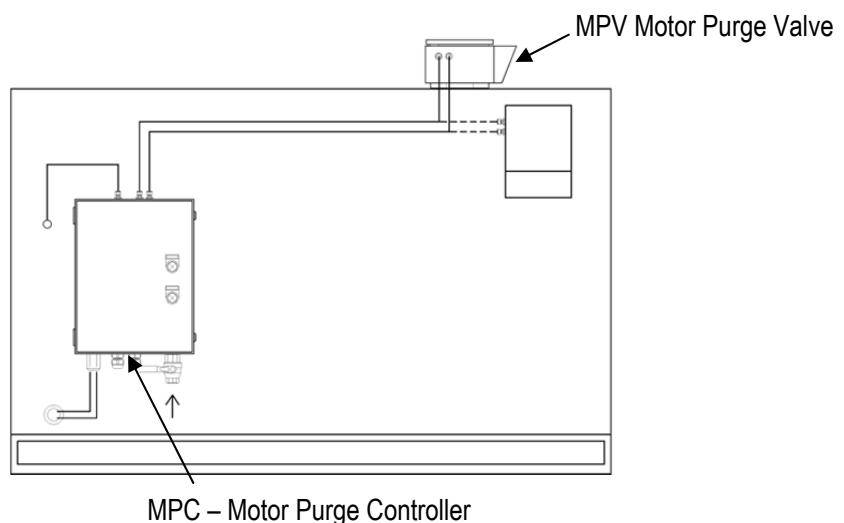
3 Installation

3.1 Mounting Positions

⚠ DANGER	
	<p>Death or serious physical injury if the purge gas supply and the pressure monitor outlet are installed incorrectly.</p> <p>This interferes with the purging action in the pressurized enclosure. Gas bubbles can form inside the pressurized enclosure and lead to an explosion when the installed parts are activated.</p> <ul style="list-style-type: none"> ➤ The purge gas valve and the pressure monitor must not be mounted exactly opposite. ➤ If they are mounted opposite each other, use angled pieces or other mechanical aids to direct the flow of purge gas to allow smooth purging.

The Motor Purge Controller consists of Motor Purge Controller and Motor Purge Valve. It is mounted onto the exterior of the Ex p motor.

Between Motor Purge Controller and MPV Motor Purge Valve, there have to be laid two additional connections for control and pressure measurement.



3.2 Motor Purge Valve

The Motor Purge Valve is affixed to the Ex p motor by means of a flange. The motor purge valve functions irrespective of position and it can be mounted either horizontally or vertically.

To attach the motor purge valve, a mating flange is required on the Ex p Motor. The flange must be screwed on with four M18 screws.

See the Technical Data chapter for the dimensions of the different connection flange variants.

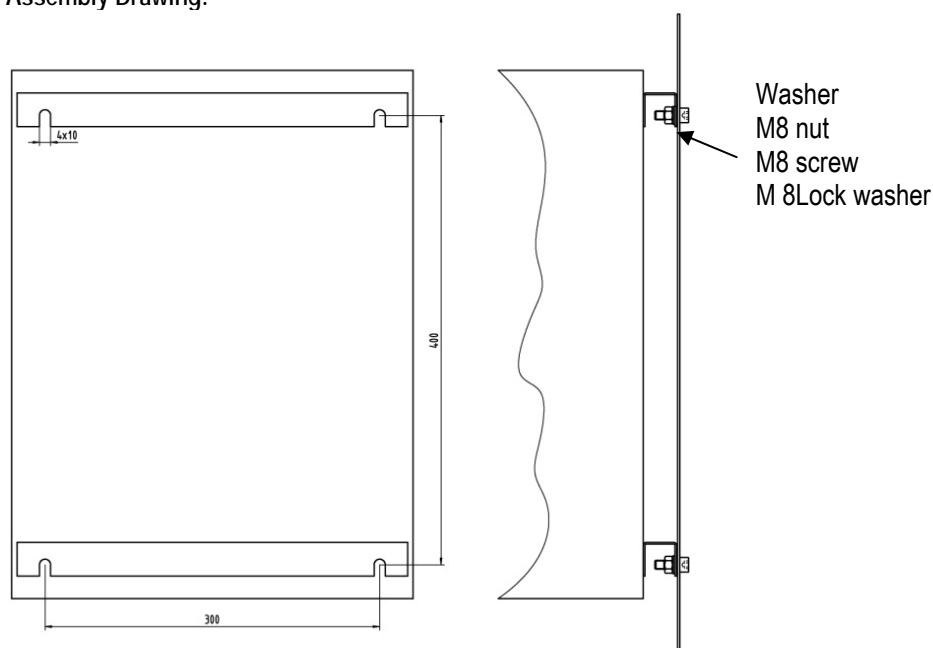
3.3 Motor Purge Controller

3.3.1 Motor Purge Controller (Standard and Extended Temperature Range)

The Motor Purge Controller is mounted onto the exterior of the Ex p motor.

It can be hooked in and fastened by means of the assembly rails fitted onto the Motor Purge Controller.

Assembly Drawing:



① Note



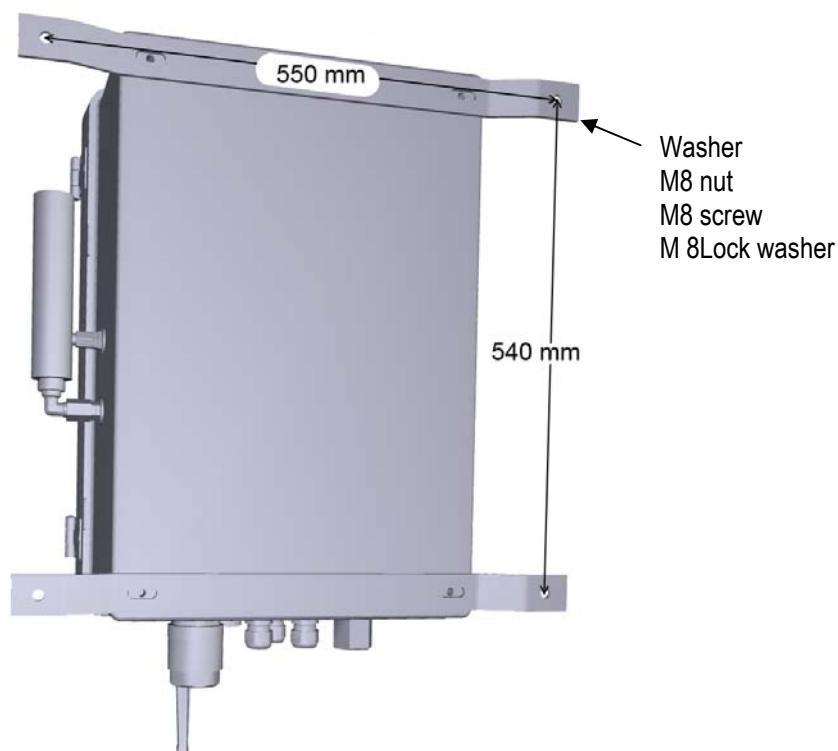
- The mounting material for the MPC control unit is not included in the scope of supply.

3.3.2 Motor Purge Controller (HT)

The Motor Purge Controller (HT) is mounted onto the exterior of the Ex p motor.

It can be hooked in and fastened by means of the assembly rails fitted onto the Motor Purge Controller.

Assembly Drawing:



Note



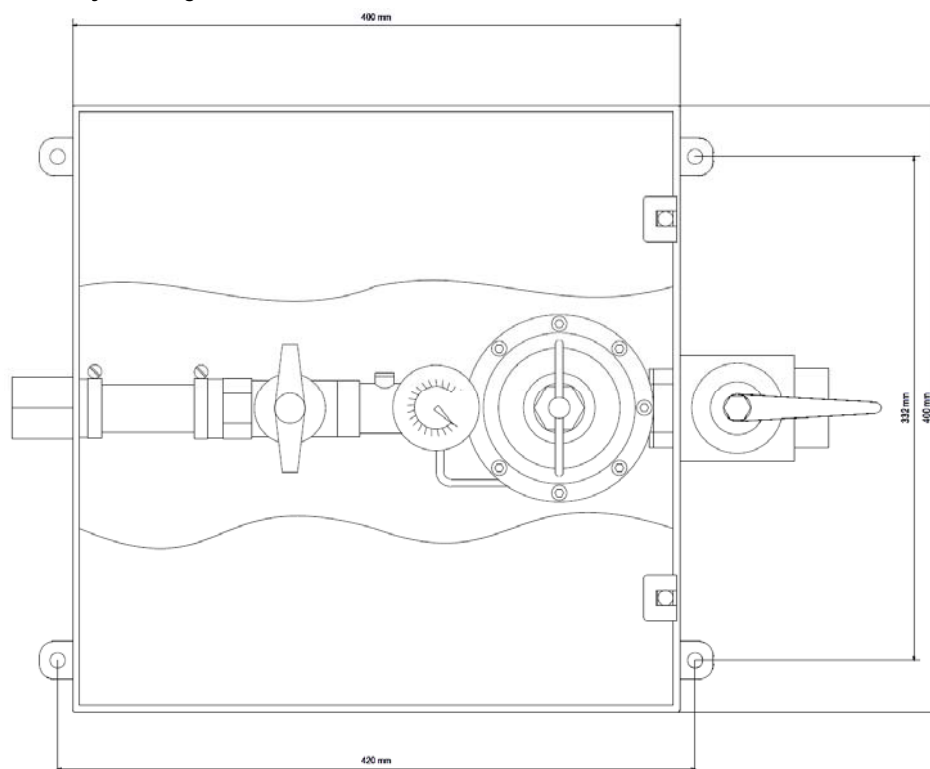
- The mounting material for the MPC control unit is not included in the scope of supply.

3.3.3 Manual Leakage Loss Compensation

The manual leakage loss compensation is mounted on the exterior of the Ex p motor.

It can be attached to the enclosure by means of mounting tabs.

Assembly Drawing:



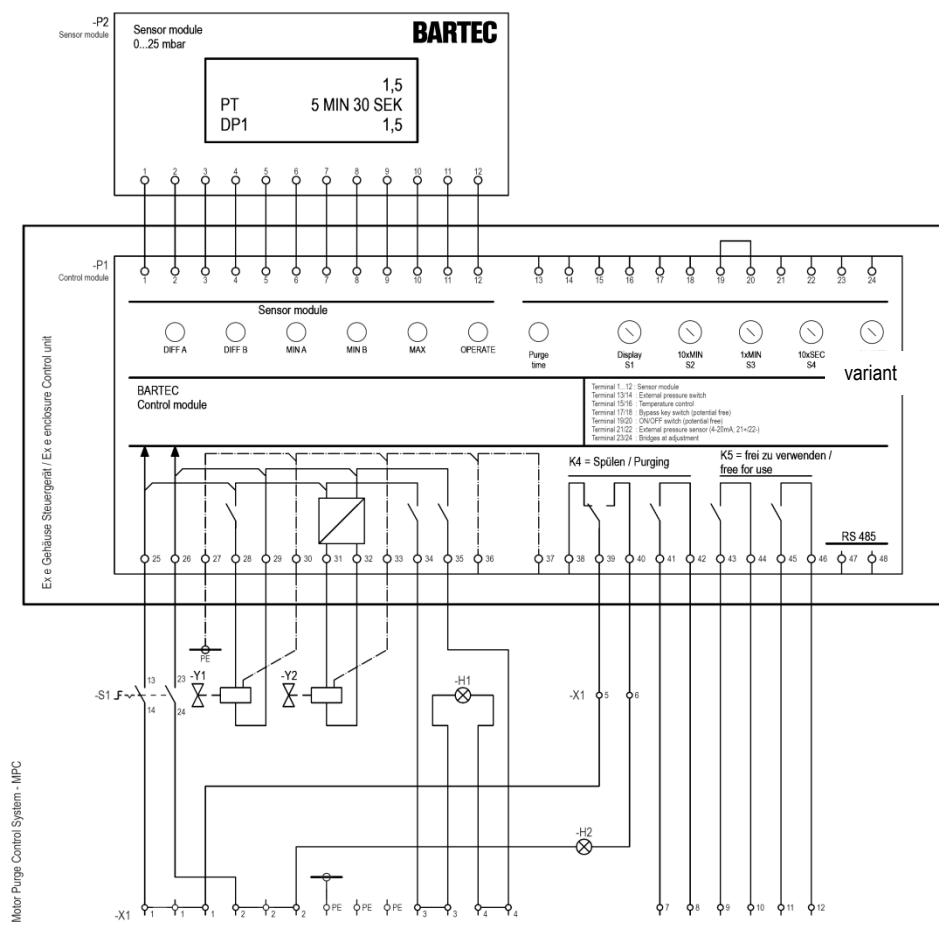
① Note



- Mounting material for the leakage air increase is not included in the scope of supply.

4 Connections

4.1 Electrical Connection for the Motor Purge Control System



A -X1 terminal block is integrated in the Control unit APEX 2003.MPC of the Motor Purge Controller. The -X1 terminal block serves to connect the signals required by the customer and to feed the voltage supply.


-X1 terminal block (customer's connection points):


Terminal block	Function	Designation
1	Supply	L
2	Supply	N
3	Ex p enabling	L'
4	Ex p enabling	N'
5, 6, 7, 8	K4 relay	Purging time
9, 10, 11, 12	K5 relay	freely programmable

Components and function:

Component	Function	Designation
-S1	Main Switch	Only by MPC Sx and SxC
-Y1	Purge valve	
-Y2	Leakage compensation valve	
-H1	Visualization Operate	Enable Ex p
-H2	Visualization Purging/Cooling	Purging or Colling active

4.2 Wiring Regulation

⚠ DANGER	
	<p>Death or serious physical injury if the wires in the MPC control unit are installed incorrectly.</p> <p>Lay the wires only in the space between the shield bus and the connecting terminals. Wires must not jut out or protrude.</p> <p>➤ Make sure there are no loose wires in the MPC Control Unit.</p>

⚠ WARNING	
	<p>Risk of death or injury if the MPC Control Unit is operated with an open cover.</p> <p>The explosion protection is no longer assured.</p> <p>➤ Do not open the cover of the Motor Purge Control System in an explosive atmosphere!</p>

- Loosen the fastening screws (4 screws) on the lid of the Control unit APEX 2003.MPC and take off the lid.
- Feed the supply, data and enable line through the cable glands into the Ex e junction box.
- Establish the electrical connections in accordance with the terminal assignment. Screw the terminals in securely with 0.4 - 0.6 Nm.
- Put the shield and earthing connection onto the shield bus.
- Use appropriate closures to seal cable glands that are not in use.
- Tighten cable glands with 3.0 Nm.
- Put the lid onto the Control unit APEX 2003.MPC and tighten the 4 fastening screws with 1.4 Nm.

4.2.1 Supply Voltage

ATTENTION

Damage due to incorrect supply voltage.

The control module's internal fuse is destroyed.

- Before activating the supply voltage, compare the supply voltage level with the level printed on the APEX control unit.

The supply voltage specified on the control module must be connected to terminals 1, 2 and PE in terminal block -X1.

The customer must protect the supply voltage with a fuse (max. 16 A).

Terminal block X 1	Connection	Function
1	L	Phase
2	N	Neutral conductor
PE	PE	Earthing

4.2.2 Ex p Enabling

ATTENTION

Damage due to overcurrent at the control module.

The control module's internal fuse is destroyed.

- The Ex p enabling (relays K2/3; terminals 3 and 4) may be operated only in conjunction with a mains fuse (max. 5 A, 1.500 A switching capacity, quick-acting).

The pressurized motor is enabled by means of the APEX control unit. There must not be any voltage at the pressurized motor when the MPC control is deactivated.

The maximum which the Ex p enabling can switch is a single-phase circuit with neutral conductor and a maximum load of 5 A. If the current load inside the pressurized enclosure is polyphase or more than 5 A, it must be constructed with a separately certified Ex d contactor activated by the APEX control unit.

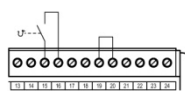
Terminal block X 1	Connection	Function
3	L'	Enabling phase
4	N'	Enabling neutral conductor
PE	PE	Earthing

4.3 Technical Options

Motor purge controller options which are available as standard are described in the following chapters.

These can be produced easily by using further components.

4.3.1 Temperature Monitoring

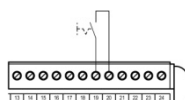


A thermostat can be connected to terminals 15 and 16 in the control module. If the temperature rises to an excessive level, the purge gas valve opens, which allows purge gas to be conducted into the Ex p area for cooling purposes.

Function: once the set temperature (N/O contact) is reached, the purge gas quantity is connected for the duration of the increased temperature. Accordingly, the increased purge gas flow cools the Ex p motor.

Note: The temperature monitoring described above does not monitor surface temperatures in the sense intended under explosion protection. If temperatures need to be monitored in the sense intended in explosion protection, a separate redundant temperature monitoring must be installed.

4.3.2 ON/OFF Switch



At terminals 19 and 20 a switch can be connected for switching relays K2/3 on or off manually after the purging phase. The intrinsically safe activation enables the connection of a standard switch. If no switch is needed for switching relays K2/3 on or off manually, a bridge must be connected at terminals 19 and 20 (factory-fitted).

4.3.3 Bypass Key Switch

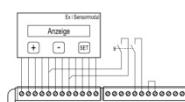
DANGER



Death or serious physical injury if the MPC is operated incorrectly in the "Bypass Operation".

Commissioning with a "bypass key-operated switch" requires the approval of the works supervisor or his/her appointee.

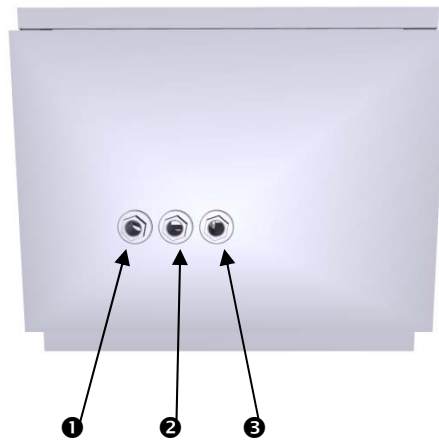
- Approval may be given only if it has been ensured that there will not be any explosive atmosphere for the duration of the necessary work or if the necessary protection measures have been taken against the risk of explosion (fire permit).



For adjusting work, a 2-pole bypass key-operated switch can be connected to terminals 5/8 and 17/18. The bypass key-operated switch is activated by the control module with intrinsic safety and connects the K2/3 relay without the supply of purge gas for adjusting work (relays K4 and K5 switch depending on their configuration).

4.4 Positioning of the Pneumatic Connections

4.4.1 Connections to the Motor Purge Controller - MPC



MPC Connection	Target Connection	Function
❶ - MPC (I)	Ex p motor	Measurement of internal pressure in motor
❷ - MPC (L)	MPV (L)	Measurement of differential pressure
❸ - MPC (A)	MPV (A)	Activation of the MPV



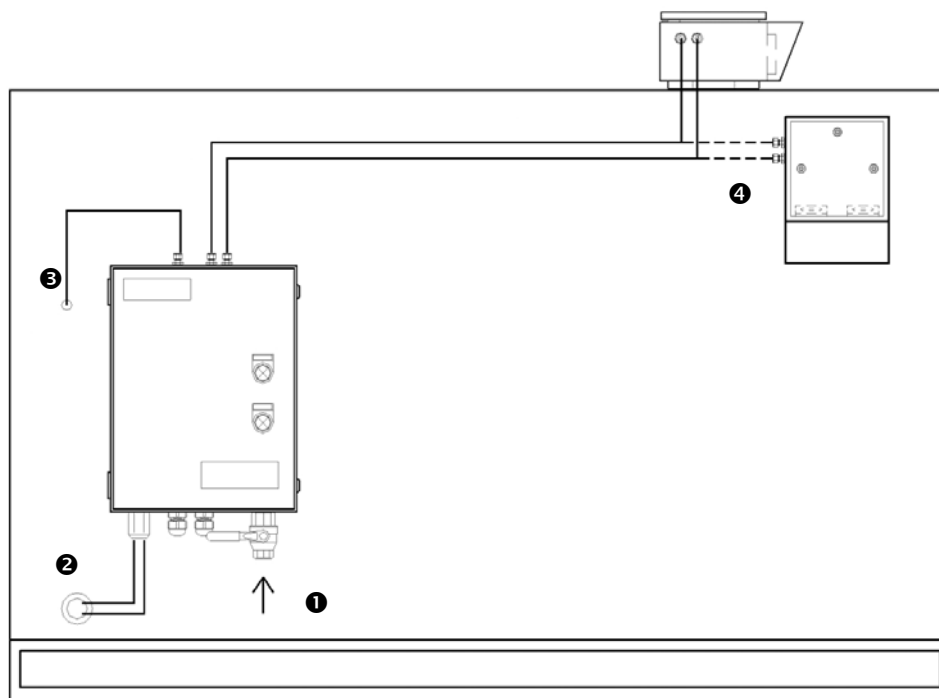
MPC Connection	Target Connection	Function
Ex p motor	Ex p motor	Supply of purge gas to the motor
❷ - Purge gas supply	By the customer	Purge gas supply by the customer

4.4.2 Connections on the MPV Motor Purge Valve



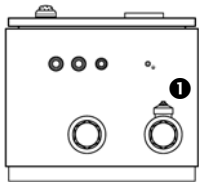
MPC Connection	Target Connection	Function
❶ - MPV (A)	MPC (A)	Activation of the MPV
❷ - MPV (L)	MPC (L)	Measurement of differential pressure

4.5 Pneumatic Connection Motor Purge Control System - Standard Option

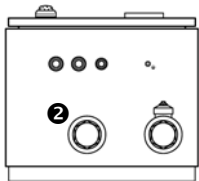


The following pneumatic connections must be established for the Motor Purge Control System:

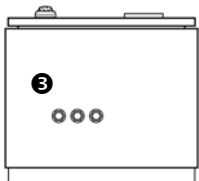
❶ - Purge gas supply:

	System	Size
	MPC S2	G1" internal thread
	MPC S3	G1 ½" internal thread
MPC Connection	Function	
Purge gas supply	Purge gas supply from the customer	

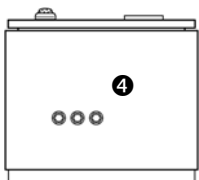
❷ - Purge gas connection for the Ex p motor

	System	Size
	MPC S2 / S3	G1" internal thread
MPC Connection	Function	
Purge gas supply	Purge gas supply to the motor	

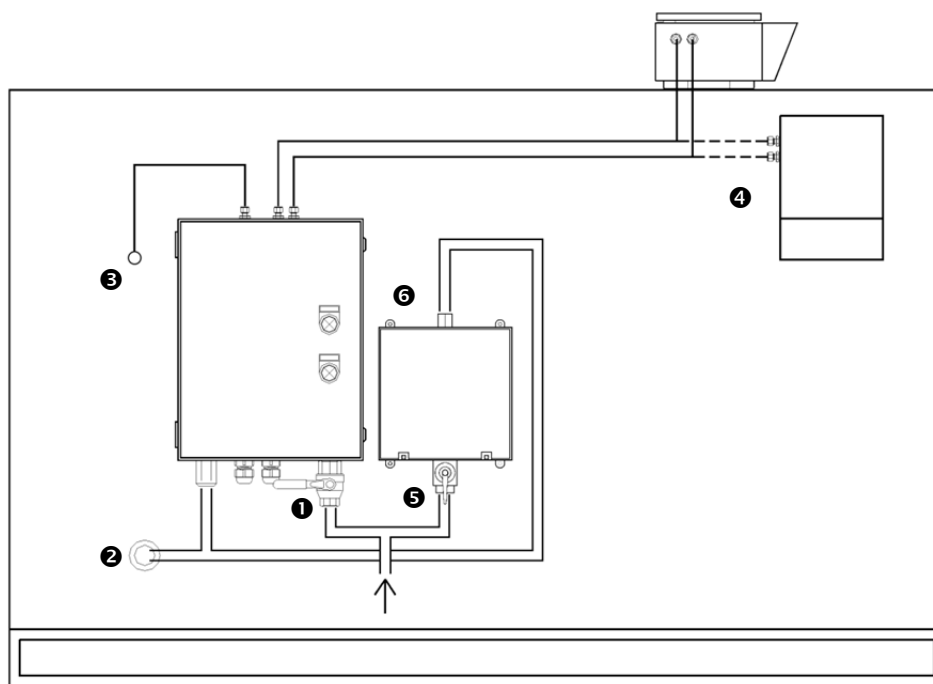
③ - Internal pressure measurement

	System	Size
	MPC S2 / S3	10-mm pipe connection
MPC Connection	Target Connection	Function
Internal pressure measurement (I)	Ex p motor	Internal pressure measurement in the Ex p motor

④ - MPV connections

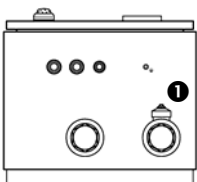
	System	Size
	MPC S2 / S3	10-mm pipe connection
MPC Connection	Target Connection	Function
MPV (A)	MPV (A)	Activation of the MPV
MPV (L)	MPV (L)	Measurement of the differential pressure

4.6 Pneumatic Connection of the Motor Purge Control System – Manual Leakage Compensation Variant

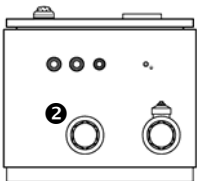


The following pneumatic connections must be established for the Motor Purge Control System:

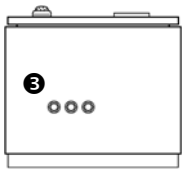
❶ - Purge gas supply:

	System	Size
	MPC S2	G1" internal thread
	MPC S3	G1 ½" internal thread
MPC Connection	Function	
Purge gas supply	Purge gas supply from the customer	

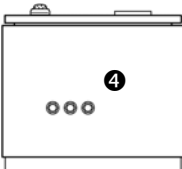
❷ - Purge gas connection for the Ex p motor

	System	Size
	MPC S2 / S3	G1" internal thread
MPC Connection	Function	
Purge gas supply	Purge gas supply to the motor	


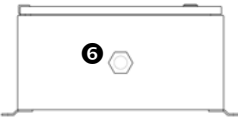
③ - Internal pressure measurement

	System	Size
	MPC S2 / S3	10-mm pipe connection
MPC Connection	Target Connection	Function
Internal pressure measurement (I)	Ex p motor	Internal pressure measurement in the Ex p motor

④ - MPV connections

	System	Size
	MPC S2 / S3	10-mm pipe connection
MPC Connection	Target Connection	Function
MPV (A)	MPV (A)	Activation of the MPV
MPV (L)	MPV (L)	Measurement of differential pressure

⑤ / ⑥ - Connections leakage compensation increase

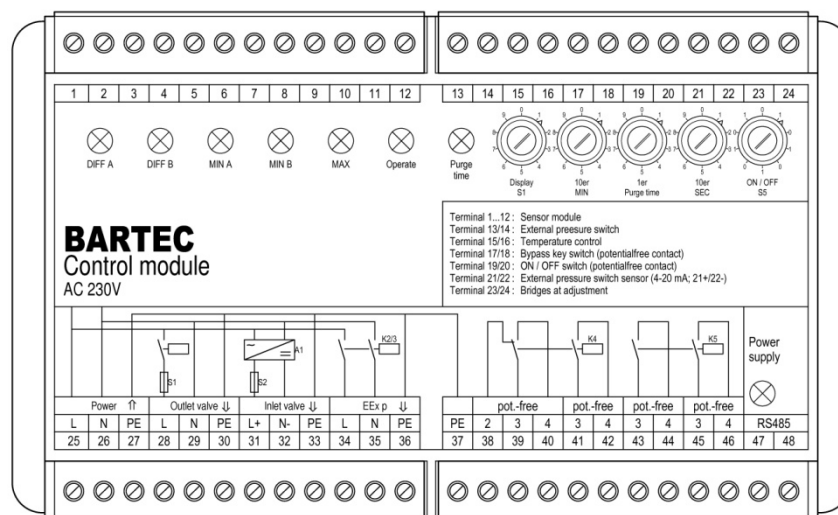
	System	Size
	Leakage compensation increase	G1" - internal thread
Connection	Target Connection	Function
Purge gas supply	Shut-off cock	Purge gas supply
	System	Size
	Leakage compensation increase	G1" - internal thread
Connection	Target Connection	Function
Leakage compensation increase	Ex p motor	Leakage compensation increase

5 Using and Operating

5.1 Setting of Parameters

All the necessary settings, including parameter settings, are carried out on the control module, which is installed in the control unit.

The following diagram shows the control module:



5.2 Rotary Switch S 1 on the Control Module

The S1 rotary switch is used to display the various switching levels in the sensor module's control unit.

S1 switching position at position:

Pos.	Display	Description
0	DP 1	Setpoint level for the pressure inside the motor / remaining purge time.
1	DIFF A	Minimum differential pressure A during the purge time.
2	DIFF B	Minimum differential pressure B during the purge time.
3	MIN A	Minimum positive pressure A during operation.
4	MIN B	Minimum positive pressure B during operation.
5	MAX	Maximum positive pressure during operation.
6	MAX 1	Maximum positive pressure during purge operation.
7	MIN P	Internal pressure pre-alarm
8	K 4	Signal relay programmed to purge operation
9	K 5	Freely programmable signal relay

5.3 Rotary Switches S 2 to S 4 on the control Module

The purge time is adjusted with rotary switches S 2 to S 4.

The following steps are observed when adjusting the purge time:

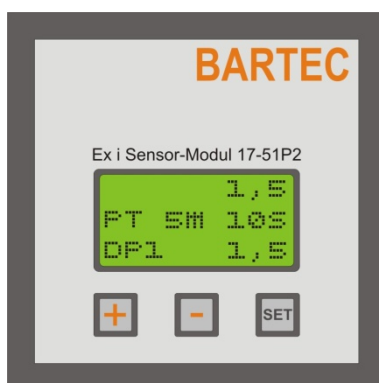
- Purge time must be determined with "DIFF A".
- Adjustment device must be connected to terminals 23 and 24.
- Purge time must be set at rotary switches S2, S3 and S4.
- The system is started again by turning the S5 rotary switch (reset) to 0 and back to 1.
- Purge time must be shown in the sensor module display.
- Adjustment device at terminals 23 and 24 must be removed.

5.4 S5 rotary switch on the control module

The S5 rotary switch is an ON/OFF switch and serves to switch the Ex p control on and off, restart the system when adjusting work is being done and to reset after error messages.

0 = OFF / 1 = ON.

5.5 Alteration of the Setpoint Levels



Line 1: Display of the actual level at that moment

Line 2: Display of the purge time

Line 3: Display of the setpoint level at that moment

The (+), (-) and (SET) buttons are used for changing and saving the switching levels selected by S1. The values are not changed until the bridge contact is connected at terminals 23 and 24. The saving of the changed levels must be confirmed by pressing the SET key.

Alteration of pressure levels:

- Pressing the (+) or (-) key once increases or decreases the level by 0.1 mbar.
- The level is saved by pressing the (SET) key and the * sign shows that this value has been saved

Changing the relay function:

- Rotary switch S1 at position 9 (K5 relay).
- The function is selected with the (+) or (-) keys.
- The assigned function is saved by pressing the (SET) key.
- The control unit is restarted by pressing the S5 (brief disconnection).

The functions of the relay can be read in chapter 5.7.

5.6 Level of "DP 1 / Operating Pressure"

The operating pressure in the Ex p motor can be adjusted during the operating phase. The level is altered with the following steps:

- Turn S1 to position 0.
- Connect a bridge between terminals 23 and 24.
- Press the (+) or (-) buttons to alter the DP 1 level.
- Press the "SET" button on the sensor module to save the new level, marked (*).
- Remove the bridge between terminals 23 and 24.

5.7 Functions of Relays K4 or K5:

See chapter 5.5 for information on changing the switching functions for relay K5.

Value	Function, is activated
0	simultaneously with K 2
1	if the DIFF A level is exceeded
2	if the level falls below the MIN P level
3	if the level exceeds the MIN A switching level
4	if the MAX switching level is exceeded
5	if the MAX 1 switching level is exceeded
6	when the purge time is counting down
7	simultaneously with K 1
8	if the key-operated switch is at bridging
9	when there is internal malfunctioning

It is not allowed to change the switching level for the K4 relay because the "purging display" indicator lamp is activated by this relay. Changing the switching level will lead to the assignment of a new function to the indicator lamp.

Relay K5 is programmed as standard to the value of "K2" (0). This means that when the K2/3 relay switches, the K5 relay is activated

5.8 Motor Purge Controller Indicator Lamp

There are two indicator lights on the front of the motor purge controller, which visually signal the operating states.

"Purging/Cooling" Indicator Lamp:

The (white) indicator lamp shows that the system is in purge mode. When the purge phase is over, the indicator lamp goes out. Also the active cooling is indicated.

"Operate" Indicator Lamp:

The (green) indicator lamp shows that the system is in the operating phase. The indicator lamp goes out during purge operation or when there is a drop in pressure.

6 Commissioning

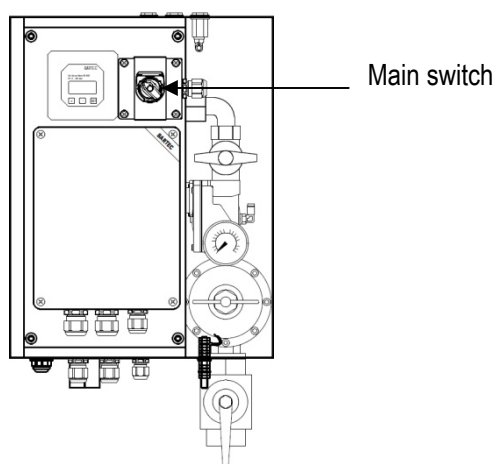
6.1 Switching the Motor Purge Control System On and Off

Inside the motor purge controller there is a main switch for switching the system on and off. This main switch is available in the standard and extended temperature range variants. In the high-temperature variant the system can be turned on and off by means of the S5 rotary switch on the control module.

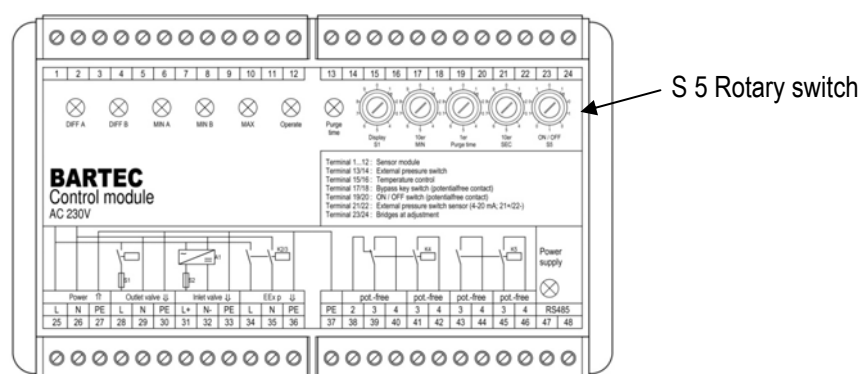
The S 5 switch must be in position 1 on the control module.

The main switch in the Motor Purge Controller switches the supply voltage on or off. It must be in the "I" position to activate the system and in the "0" position to deactivate it.

Standard and extended temperature range variants:



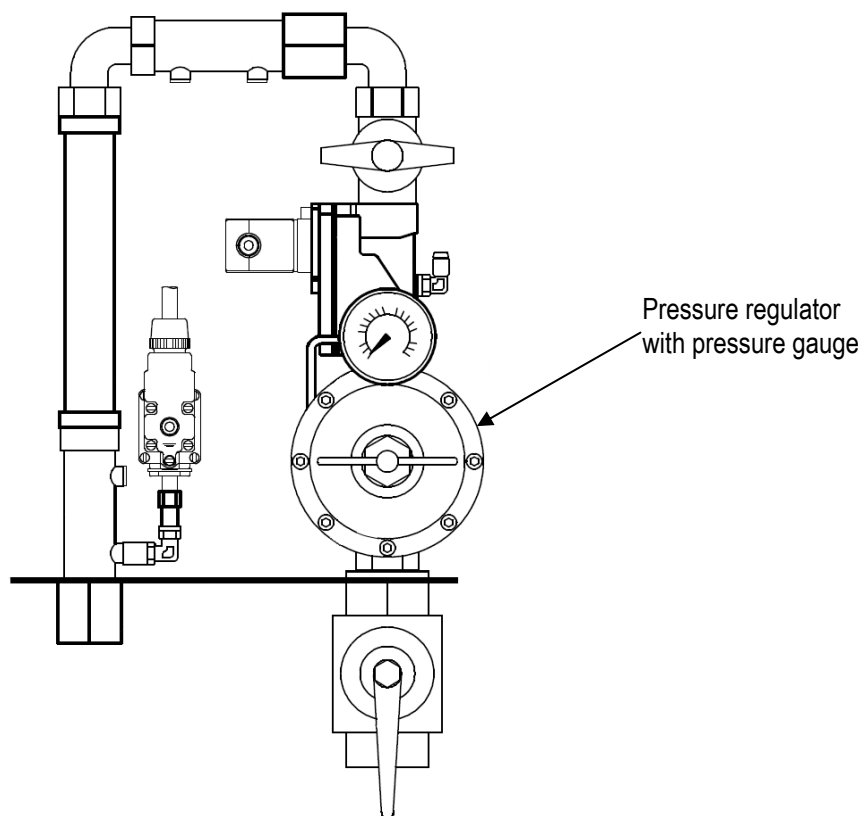
High Temperature variant:



6.2 Purge Gas Pressure Setting

The pressure regulator integrated in the motor purge controller is set to 3 bar for the optimum function. The pressure of the purge gas made available should be greater than 3 bar.

The pressure of 3 bar set on the pressure regulator can be read on the pressure gauge.



6.3 Purge Gas Volume Setting

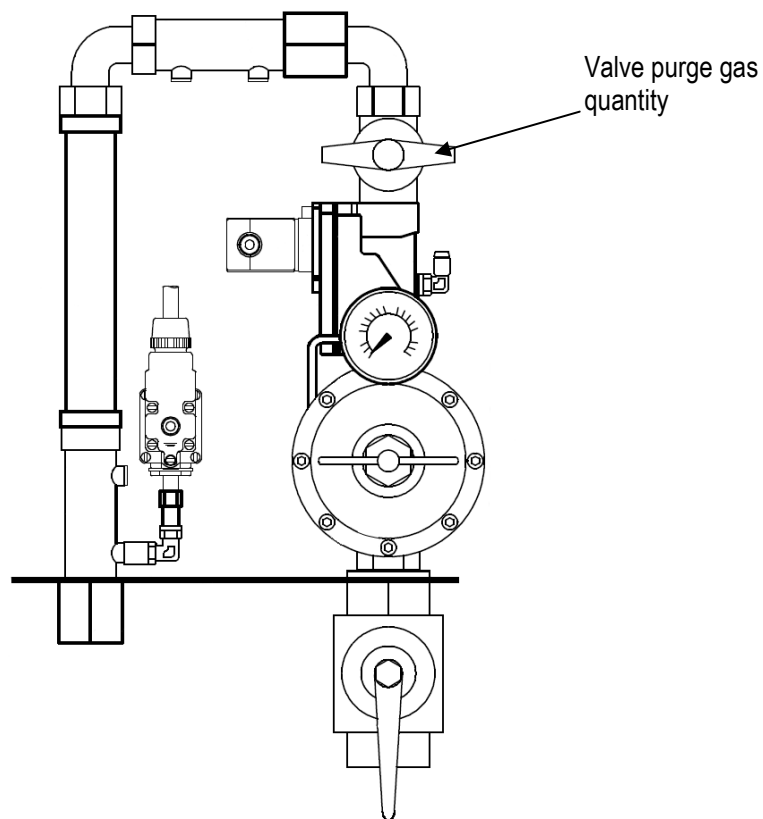
The purge gas quantity for the Ex p motor must be set inside the motor purge controller.

To set the desired volume of purge gas, the mechanical valve must be opened. This valve is closed when delivered.

The valve must be opened gradually to the extent needed to reach the required differential pressure.

If the valve is opened too wide, there is a risk of the maximum permissible pressure of the Ex p motor being exceeded and the motor purge controller will then malfunction, indicated by "Error (8)" in the display.

If the valve is not opened wide enough, the Ex p motor is not supplied with enough purge gas and the necessary purging pressure is not reached. The set purge time on the motor purge controller does not start to count down.



6.4 Setting the Manual Leakage Compensation

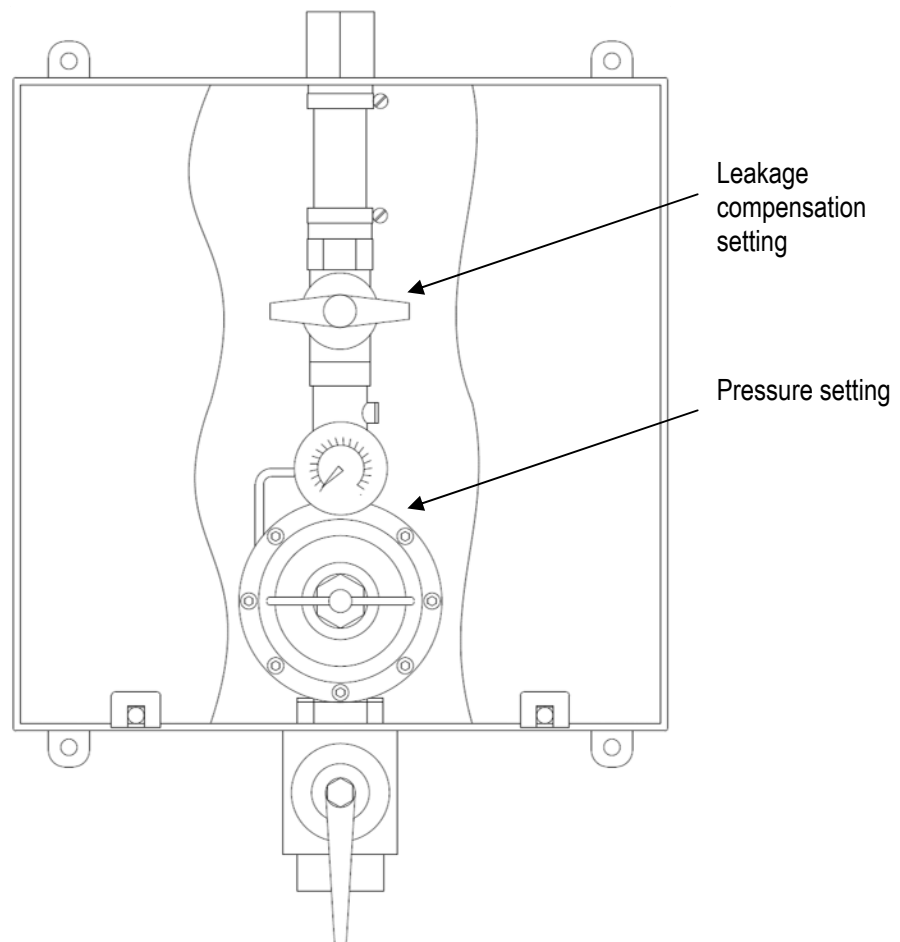
Ex p motors with an increased leakage loss can have a manual leakage compensator retrofitted. This compensates for base levels of leakage air in the Ex p motor. Peak levels are compensated by means of the proportional valve integrated in the MPC.

To set the leakage compensation on the pressure reducer, the same pressure level is used as is used in the MPC system. The required leakage air quantity is set by means of the ball cock.

The externally mounted shut-off valve serves to activate / deactivate the leakage compensation.

It is recommendable to use a flow rate measuring device to determine the leakage losses.

When setting the MPC system, the leakage compensation should be deactivated.



6.5 Checking and Setting the Purge Phase

It is assumed in the following that the determination of the quantity of purge gas will depend on the enclosure capacity (volume-dependent purge time). When testing with the gas concentration measurement process, the resulting purge time must be determined by the test engineer on an individual basis.

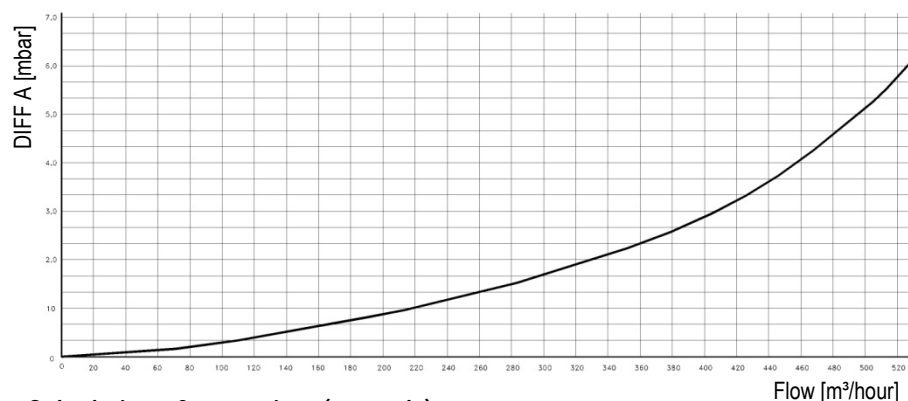
Volume-dependent purge time:

- Connect the mains voltage and use the S 1 main switch to switch on the Motor Purge Controller.
- The “purge gas quantity” valve must be opened slowly until the maximum permissible motor enclosure pressure or until the maximum extraction quantity of purge gas is reached.
- The DIFF A value is read from the sensor module. (S 1 to position 1)
- Read purging gas volume from the diagram. Diagrams are available in the appendix.
- The purge time is calculated in accordance with the following formula:

$$\text{urge time [minutes]} = \frac{\text{Enclosure capacity [m}^3\text{]} \times x - \text{times purging}}{\text{flow [m}^3\text{/hour]}} \times 60$$

- Set the calculated purge time by means of the S2 to S4 rotary switches.

Example of a typical “DIFF A differential pressure” curve as a function of the purging volume”:



Calculation of purge time (example):

Motor capacity = 5 m³; 7 x purging circulation.

Required purge gas quantity: 5 m³ x 7 x purging circulation = 35 m³

Display of the sensor module = 1 mbar (S1 to Pos.1)

Purge gas quantity in accordance with diagram = 130 m³/h

Purge time = 35 m³/130 m³/h x factor 60 = 16 minutes 20 seconds

If the “MIN A”, “MIN B”, “DIFF A” and “DIFF B” minimum levels are exceeded, the “purge time on” LED flashes and the displayed purge time counts down.


6.6 Checking the Operating Phases

When checking the operating phases, see if the prescribed functions are fulfilled when the level falls below the minimum. The operating phase can be checked as follows:

- Start purge phase by activating the supply voltage and purge gas.
 - The “purging” indicator lamp is on.
 - The “operate” indicator lamp is off.
- Let the purge phase run.
- The motor’s operating pressure (DP 1) builds up and stabilizes
 - “Purging” indicator lamp off.
 - “Operate” indicator lamp on.
- Connect the programming bridge at terminals 23 and 24 of the control module.
- -S1 rotary switch in Position “0”.
- Reduce the motor pressure slowly by means of the (-) key on the sensor module.
 - The light-emitting diodes for “MIN A” and “MIN B” on the control module go out.
 - The “Operate” light-emitting diode on the control module goes out with a 5-second time delay.
 - The “Operate” indicator lamp on the motor purge controller goes out.
 - Enabling of the Ex p motor is reset.
- Reset the operating pressure (DP 1) by means of the (+) key to the initial level.
- Let the purge phase run and check the set purge time.
 - “Purging” indicator lamp off.
 - “Operate” indicator lamp on.
- Remove the programming bridge at terminals 23 and 24 of the control module.

7 Operation

7.1 Safety during Operation

⚠ DANGER	
	Death or serious physical injury due to a damaged explosion protection measure. It is no longer possible to operate the control unit without risks.
	Risk of explosion ➤ Put the Motor Purge Control System out of operation and protect it against unintended reconnection.

7.2 Operating Principle

Once the motor purge control system is activated, it automatically monitors the purge gas flow and positive pressure during the purge and operating phase.

There are two indicator lamps on the door of the motor purge controller. These show the respective operating mode of the motor purge control system.

- Indicator lamp white “PURGING” = purge operation
- Indicator lamp green: “OPERATE” = operating phase Ex p motor

Once the motor purge control system is activated, purge gas is conducted into the Ex p motor through the leakage compensation valve and the level of pressure rises above the minimum pressure (“MIN A” and “MIN B”). As a consequence of this increase in pressure, the motor purge controller opens the purge gas valve and the motor purge valve automatically.

This causes purge gas to flow through the Ex p motor and the minimum differential pressure (“DIFF A” and “DIFF B”) is reached. The “MIN A”, “MIN B”, “DIFF A” and “DIFF B” LEDs light up on the control module inside the motor purge controller. The “Purge time on” LED flashes.

The purge operation is indicated by means of the “PURGING” lamp on the door.

To prevent an inadequate purging of the Ex p motor due to an insufficient flow of purge gas, the remaining purge time is reset to the initial level if the purge gas flow drops to below the “DIFF A” or “DIFF B” switching levels. The “purge time on” LED turns off then. The purge time starts again once the set flow rate is reached. At the end of the purge time, the operating phase is initiated automatically by the following actions:

- The purge gas valve closes and the leakage losses are compensated by means of the integrated proportional valve.
- The “OPERATE” indicator lamp lights up.
- Relay K 2/3 connects the enabling mains voltage.
- The purge time display goes out and the existing pressure inside the enclosure is displayed on the sensor module.
- Relays K 5 switch depending on the configuration.

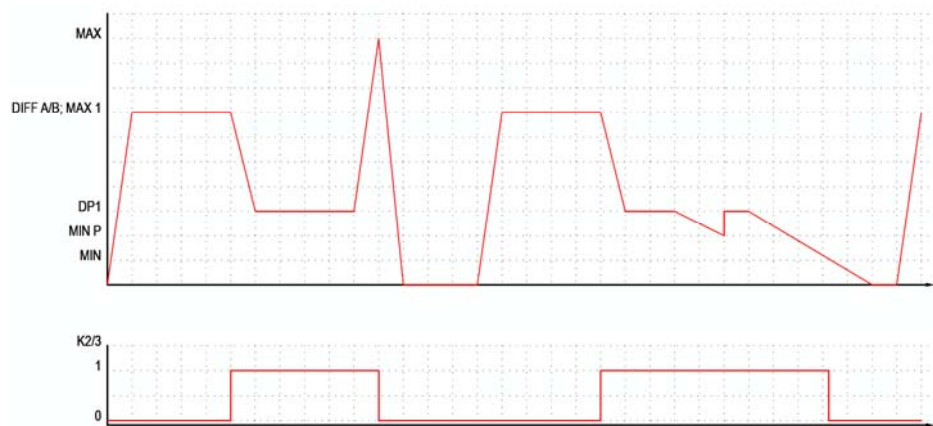
If the pressure inside the motor drops below the switching levels of “MIN A” or “MIN B” during the operating phase, K 2/3 opens with a time delay of approx. 5 seconds to compensate for any fluctuations in purge gas in the system. At the same time, K 5 switches depending on the configuration.

The K4 relay is programmed to signal “Purge time”.

Relay K 5 is freely programmable (floating contact) and can be programmed depending on the configuration as described in Chapter 5.7.


7.3 Functional Diagram

The motor purge control system is equipped with an integrated pressure control valve, which ensures that the pressure is maintained at a constant level during the operating phase. The following diagram shows how the pressure in the motor develops over time.



- 1 The purging procedure is started by switching on the MPC.
- 2 Once the set purge pressure is reached, the purge time starts
- 3 End of the purge time
- 4 Normal operation and regulation to the set operating pressure DP 1
- 5 Malfunctioning due to the build-up of excessive pressure
- 6 Enabling (K2/3) switched off until MPC reset by means of S5.
- 7 Beginning of the purging procedure
- 8 Once the set purge pressure is reached, the purge time starts
- 9 End of the purge time
- 10 Normal operation and regulation to the set operating pressure DP 1
- 11 Min P pre-alarm
- 12 The purge gas valve is opened to maintain the internal pressure
- 13 Min P pre-alarm
- 14 Drop in pressure to under MIN and enabling (K2/3) stopped accordingly
- 15 Beginning of the purging procedure
- 16 Once the set purge pressure is reached, the purge time starts

7.4 Types of Purge Gas

⚠ DANGER	
	Death or serious physical injury due to purge gas escaping when the pressurized enclosure is opened.
	Risk of suffocation ➤ Stop the supply of purge gas when opening the pressurized enclosure and make sure the escaping purge gas cannot be inhaled directly.

Only inert gas (e.g. nitrogen) or cleaned and dry instrument air may be used as a purge gas. In any case, a filter must be placed upstream if the quality with respect to foreign particles is not assured.

The following quality features should be filled by the purge gas:

- Residual dust: < 40 µm
- Residual water: dew point +3 °C
- Residual oil content: 1 mg/m³

7.5 Operating Phases of the Motor Purge Control System

The operation can be divided into three phases, namely the preparatory, purging and operating phase.

7.5.1 Flow Diagram for the Operating Phases

The Motor Purge Control System is constructed in conformance to the currently applicable directives and standards and fulfils the requirements specified there. The processes in the respective states are listed in the following.

Operating phase	Requirements	Effect
Preparatory phase	• Mains voltage connected	Initiation of the purging phase
	• Internal pressure less than MAX	
	• Purge time not ended	
Purge phase	• Internal pressure larger than MIN A / MIN B	Purge time on
	• Internal pressure less than MAX	
	• Min. differential pressure > DIFF A / DIFF B	
	• Purge time ended	Initiation of the operating phase
Operating phase	• Internal pressure larger than MIN A / MIN B	Pressurized enclosure is enabled
	• Internal pressure less than MAX	
	• Purge time ended	
	• Bridge 19/20 closed	

7.5.2 Preparatory Phase

The preparatory phase begins when the supply voltage for the Motor Purge Control System is turned on and the purge gas is supplied. The purge gas flows through the purge gas valve into the pressurized enclosure.

Preparatory phase sequence:

- The influx of purge gas increases the internal pressure of the Ex p motor.
- The “MIN A and MIN B” minimum pressure is exceeded.
- LED “MIN A” and LED “MIN B” light up.
- The purge gas valve is opened by means of the control module.
- The next phase, the “purge phase”, is initiated.

7.5.3 Purge Phase

The pressurized enclosure is purged with purge gas.

To prevent the pressure inside the enclosure reaching an excessively high level as a result of an impermissibly high flow resistance at the control device's pressure monitor, the purge gas pressure is restricted during the purge time to the “MAX 1” level. This means when the “MAX 1” level is exceeded, the purge gas valve is closed for the short time.

Purging phase sequence:

- Increase the flow with purge gas.
- The plate integrated in the MPV is raised.
- The “MIN A”, “MIN B”, “DIFF A” and “DIFF B” switching levels are exceeded.
- LED “MIN A” and LED “MIN B” light up.
- The “DIFF A” and “DIFF B” LEDs light up.
- The purge time in the display counts down and the “purge time” LED flashes.
- The purge gas valve closes after the end of the purge time.
- The “DIFF A”, “DIFF B” and “Purge time” LEDs go out and the next phase, the “Operating phase”, is initiated.

7.5.4 Operating Phase

The operating phase begins when the purge gas valve closes.


The Ex p motor is released by means of the K2/3 relay integrated in the control module

If the enclosure pressure drops below the set minimum levels during the operating phase, all electrical installed parts in the pressurized enclosure which are not themselves explosion-proof, are switched off and the purging process starts again.

Operating phase sequence:

- The purge valve closes and the leakage losses are compensated.
- The “Operate” LED lights up.
- LED “MIN A” and LED “MIN B” light up.
- Relay K2/3 connects and activates the mains voltage.
- K5 relay switches depending on its configuration.
- The remaining purge time display goes out and the existing pressure inside the enclosure is displayed on the sensor module.

7.6 Bypass Operation

⚠ DANGER	
	<p>Death or serious physical injury due to commissioning with a bypass key switch in an explosive atmosphere.</p> <p>Risk of explosion</p> <ul style="list-style-type: none">➤ Have the commissioning with a bypass key switch approved by the factory manager or his appointee. Approval may be given only if it has been ensured that there will not be any explosive atmosphere for the duration of the commissioning or if the necessary precautions have been taken to protect against the risk of explosion (fire permit).➤ A warning sign informing that the Ex protection will be invalidated if the key switch is activated must be affixed near the key switch.

During the operating phase it may be necessary to change settings on internally mounted components. The Motor Purge Control System provides the bypass function as an option for this function

If the bypass mode is activated, it must be ensured that there is no explosive gas in the atmosphere. The concentration of gas in the surrounding atmosphere is determined with a gas detector.

Once the bypass mode is activated, the Ex p motor is active without purge gas supply.

The operation of the pressurized enclosure is not interrupted for this duration. The purging phase is not repeated for the pressurized enclosure.

Procedure:

- Measure the surrounding atmosphere for conformance to safe levels.
- Activate the bypass operation.
 - The display changes to "BYPASS".
- Open the door of the pressurized enclosure.
 - The enabling by relays K2/3 is not reset.
- Once the work has been completed, reset the bypass mode.
- Deactivate the bypass mode.
 - The display changes to the standard display.

8 Maintenance and Care

8.1 Regular Maintenance

Regular maintenance is not necessary if the unit is installed correctly and operated appropriately (e.g. observance of the ambient conditions).

As control unit manufacturers, we recommend an annual inspection of the cooling / heating when the motor purge control is used with the heating / cooling.

8.2 Malfunctioning and Troubleshooting

Before looking for the fault, check if the components are mounted and connected correctly (see "Mounting" section).

Note




- The following table with descriptions of faults and information relating to possible causes is based on the assumption that the components have been mounted and connected correctly.

Fault	Possible cause	Remedy
The unit is not working, the "mains" LED does not light up.	No mains voltage.	Check the mains voltage supply line.
	Main switch at pos. 0	Put main switch in Pos. I
	Device defective.	See chapter 2
The electrical units are connected without a purging cycle.	Key-operated switch is switched on or bridge is at the terminals 17 and 18.	Turn off key-operated switch, remove bridge.
	No purging gas.	Connect purging gas.
"Purge time on" LED not flashing during the purge time.	Digital valve/proportional valve does not open or only partially opens.	Check the digital valve / proportional valve for the presence of supply voltage (terminals 28 to 33)
		Check the valve switches for foreign particles in the mechanical part.
	Insufficient purging gas flow through the Ex p motor	Increase input pressure to the set level.
		Check the purging quantity adjusting valve for the right level.
		Check that the "DIFF A", "DIFF B", "MIN A" and "MIN B" pressure switches on the control unit have the correct level.
	Set pressure is not reached in the pressure reducer.	Purging gas supply too low. Increase the cross-section of the supply line.
	Due to the increased internal pressure the enclosure is not leak-tight during the purging phase.	Use suitable measures to seal the enclosure.

Fault	Possible cause	Remedy
Control unit does not connect the Ex p enabling after the purging phase.	ON/OFF switch or bridge is not connected at terminals 19 and 20.	Turn on the ON/OFF switch or bridge at terminals 19 and 20.
	The pressure in the enclosure is higher than the "MAX" switching level.	DP1 level is too high.
	"MAX" switching value too low.	Check the "MAX" switching level.
Control unit switches off after the purge time with a 5-seconds time delay.	Motor is not leak-tight enough. "MIN A" or "MIN B" pressure switch switches.	Seal the motor.
	The "DP 1" switching level is too low.	Increase the DP1 level.
	"MIN A" or "MIN B" switching level too high.	Check the "MIN A" or "MIN B" switching level.
The K4 or K5 relay does not connect.	Configuration of K 4 or K 5	Check the configuration of K4 or K5.
The electrical units do not switch off when the pressure drops.	Key-operated switch is switched on or bridge at terminals 17/18 and 5/8.	Switch off the key-operated switch. Remove bridges.
Lamp „Purging/Cooling“ is in continuous operation	Malfunction Cooling → No audible signal of cooling	Check function cooling.
Lamp „Purging/Cooling“ is active, but no audible signal of cooler	Malfunction Cooling	Check function cooling.

8.3 Error Code Table

Note	
	<p>Maintenance intervals'</p> <p>An error code will indicate any internal faults that may occur while the APEX control unit is starting up.</p> <p>If the error code is due to a fault in the purging gas supply, the fault should be eliminated and the APEX control unit reset by switching it on and off.</p>

Error code	Error Description	Remedy
(1)	Memory: The cause of the error lies in the memory area.	Use the S5 rotary switch to reset the APEX control unit. If this measure is not successful, send the control unit back to the manufacturer.
(2)	Difference between Min A and Min B: the difference measured between the Min A and Min B pressure levels is too large	Check the measuring leads. They could be bent or dirty (e.g. with oil).
(3)	MUX/AD: The cause of the error lies in the area of the Multiplexer control or the analog/digital conversion.	Use the S5 rotary switch to reset the APEX control unit. If this measure is not successful, send the control unit back to the manufacturer.
(4)	SITRANS: The cause of the error lies in the area of the opt. pressure switch connections.	Check the connections.
(5)	EEPROM: The cause of the error lies in the area of the internal EEPROM.	Use the S5 rotary switch to reset the APEX control unit. If this measure is not successful, send the control unit back to the manufacturer.
(6)	RAM: The cause of the error lies in the area of the internal RAM modules.	Use the S5 rotary switch to reset the APEX control unit. If this measure is not successful, send the control unit back to the manufacturer.
(7)	MAX 1 less than MIN: The cause of the error lies in the setting of the minimum and maximum levels whereby the maximum level was set lower than the minimum level.	Check the setpoint values.
(8)	P > max in purge time: The internal pressure in the Ex p operating equipment exceeds the maximum setpoint level.	Use the S5 rotary switch to reset and reduce the supplied purging gas flow.

9 Technical Data

9.1 Motor Purge Control System

Parameter	Category 2G	Category 3G
Ex protection type marking ATEX	⊕ II 2G Ex de ib [ia Ga px] IIC T4 Gb	⊕ II 3G Ex nC [ic pz] IIC T4 Gc
Ex protection type marking IECEx	Ex de ib [ia Ga px] IIC T4 Gb	
Temperature class	T4	T4
Type	07-3711-6210/.M..	A7-3711-6110/.M..
Mains voltage	AC 230 V or AC 115 V	
Rated capacity	approx. 20 W	
Purge gas medium	Compressed-air or inert gas	
Purging time	0...99 min	

9.1.1 Motor Purge Controller S2/S3

Parameter	MPC S2	MPC S3
Pressure switching values:		
Min A / Min B / Min P	0-25 mbar	
DP 1 / DIFF A / DIFF B	0-25 mbar	
MAX, MAX 1	0-25 mbar	
Leakage loss compensation	Self-regulating due to proportional valve technology	
	minimum:	maximum :
	0.05 l/s at 3 bar input pressure	11.5 l/s at 3 bar input pressure
Relay contacts:		
K 2/3	Switching capacity maximum 5 A at $\cos \varphi = 1$ / AC 250 V; dropout delay 5 seconds; additional fuse required	
Relays K4 and K5	Switching capacity maximum 5 A at $\cos \varphi = 1$ / AC 250 V; no dropout delay	
Flow rate	0-180 m³ at 3 bar	0- 450 m³ at 3 bar
Connections:		
Connecting terminals	Per terminal maximum 1 x 2.5 mm²	
Cable glands	2 x M25x1.5 black / 1 x M20x1.5 black	
Purge gas inlet	R 1" internal thread	R 1 ½" internal thread
Purge gas outlet	R 1" internal thread	R 1" internal thread
Signal lines	3 x pipe connection 10 mm	

9.1.2 Motor Purge Controller - Standard

Parameter	MPC S2	MPC S3
Type	.7-3711-6 . 10/ . M20	.7-3711-6 . 10/ . M30
Enclosure material	sheet steel, painted, RAL 7035	
Ambient temperature	-20°C to +40°C	
IP degree of protection	IP 22 (all internal components in IP 65)	

9.1.3 Motor Control Controller - with Extended Ambient Temperature Range

Parameter	MPC S2C	MPC S3C
Type	.7-3711-6 . 10/ . M25	.7-3711-6 . 10/ . M35
Enclosure material	sheet steel, painted, RAL 7035	
Ambient temperature	-20°C to +45°C	
Cooling capacity	290 W	
IP degree of protection	IP 55	

9.1.4 Motor Control Controller – with High Ambient Temperature Range

Parameter	MPC S2 HT	MPC S3 HT
Type	.7-3711-6 . 10/ . M27	.7-3711-6 . 10/ . M37
Enclosure material	Glass fibre reinforced polyester (GFRP) with PU insulation	
Color	RAL 7032	
Ambient temperature	-30 °C bis +50 °C	
Cooling capacity	290 W	
Heating capacity	50 W	
IP degree of protection	IP 55	

9.2 MPV Pressure Monitor

Pressure Monitor	MPV 2	MPV 3
Type	17-51P3-3803	17-51P3-3903
Operation	only with MPC S2	only with MPC S3
IP degree of protection	IP 54	
Spark and particle barrier	integrated	
Pressure relief	integrated	
Ambient temperature	-30°C to +60°C	
Connection flange	DIN2633 NW50 PN16	DIN2633 NW100 PN16
Signal lines	2 x pipe connection 10 mm	
Installation	horizontally or vertically	

9.3 Manual Leakage Compensation

Man. leakage compensation	
Type	05-0056-0069
Operation	Only with Motor Purge Control System
IP degree of protection	Min. IP 55
Connections	G1" internal thread, metall
Flow rate	0-180 m ³
Ambient temperature	-30 °C to +50 °C
Installation	horizontally or vertically

9.4 Purge Gas Quality

Purge Gas Quality	
Residual dust	< 40 µm
Residual water	Dew point +3°C
Residual oil content	1 mg/m ³
Max. temperature	+40 °C

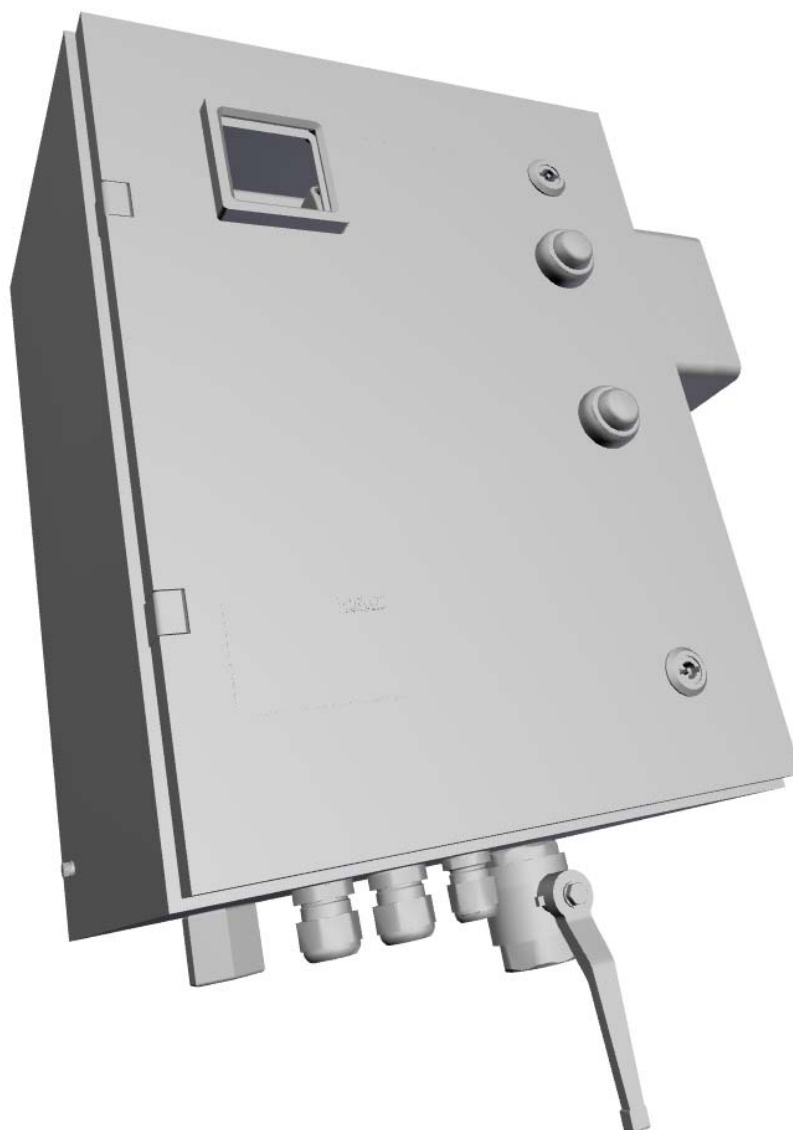
9.5 Dimensions of the System Components

9.5.1 Dimensions of the Motor Purge Control System – Standard Option



Dimensions [mm]	Width	Depth	Height
MPC S2 / S3	360	280	470

9.5.2 Dimensions of the Motor Purge Control System – Variant with an extended Temperature Range



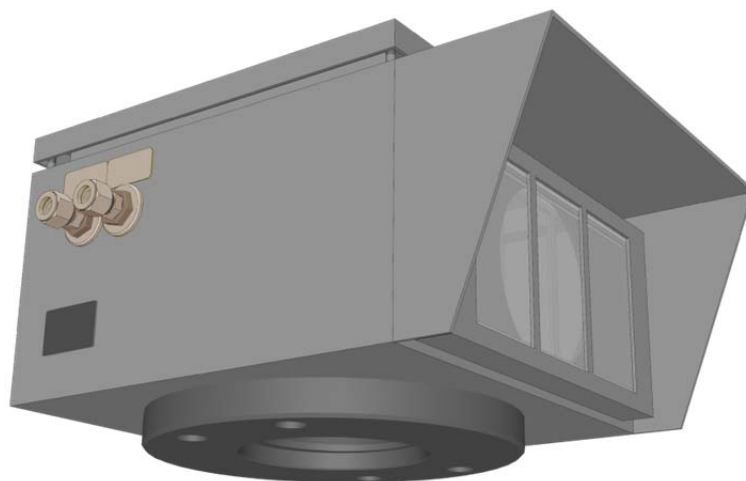
Dimensions [mm]	Width	Depth	Height
MPC S2 / S3	485	280	470

9.5.3 Dimensions of the Motor Purge Control System – High Temperature Variant



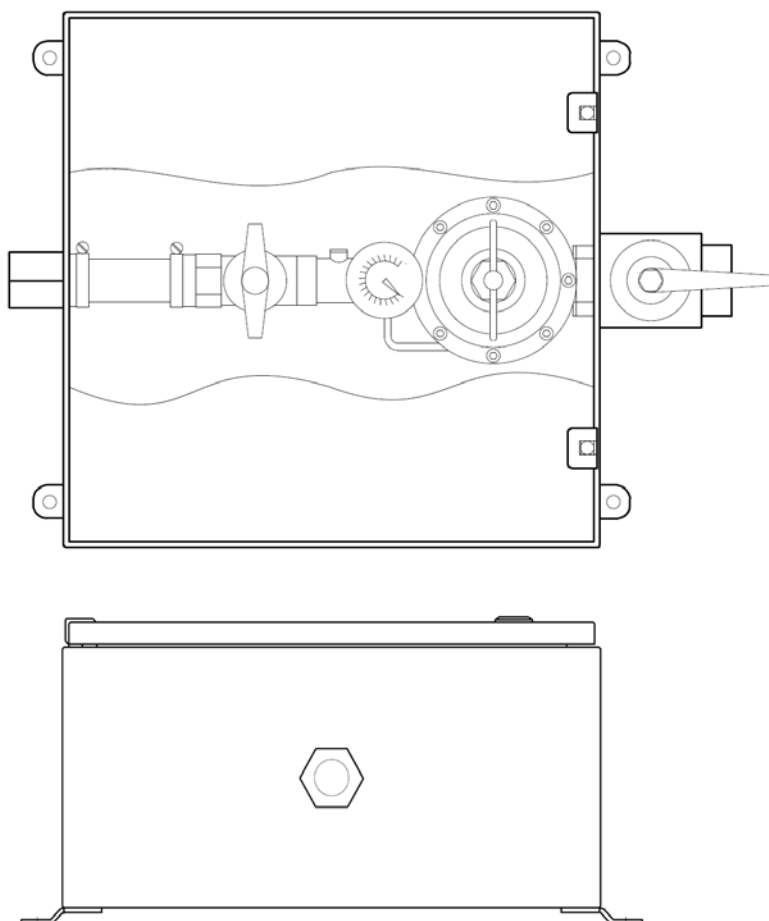
Dimensions [mm]	Width	Depth	Height
MPC S2 / S3	440	340	640

9.5.4 Dimensions of the MPV Pressure Monitor Module



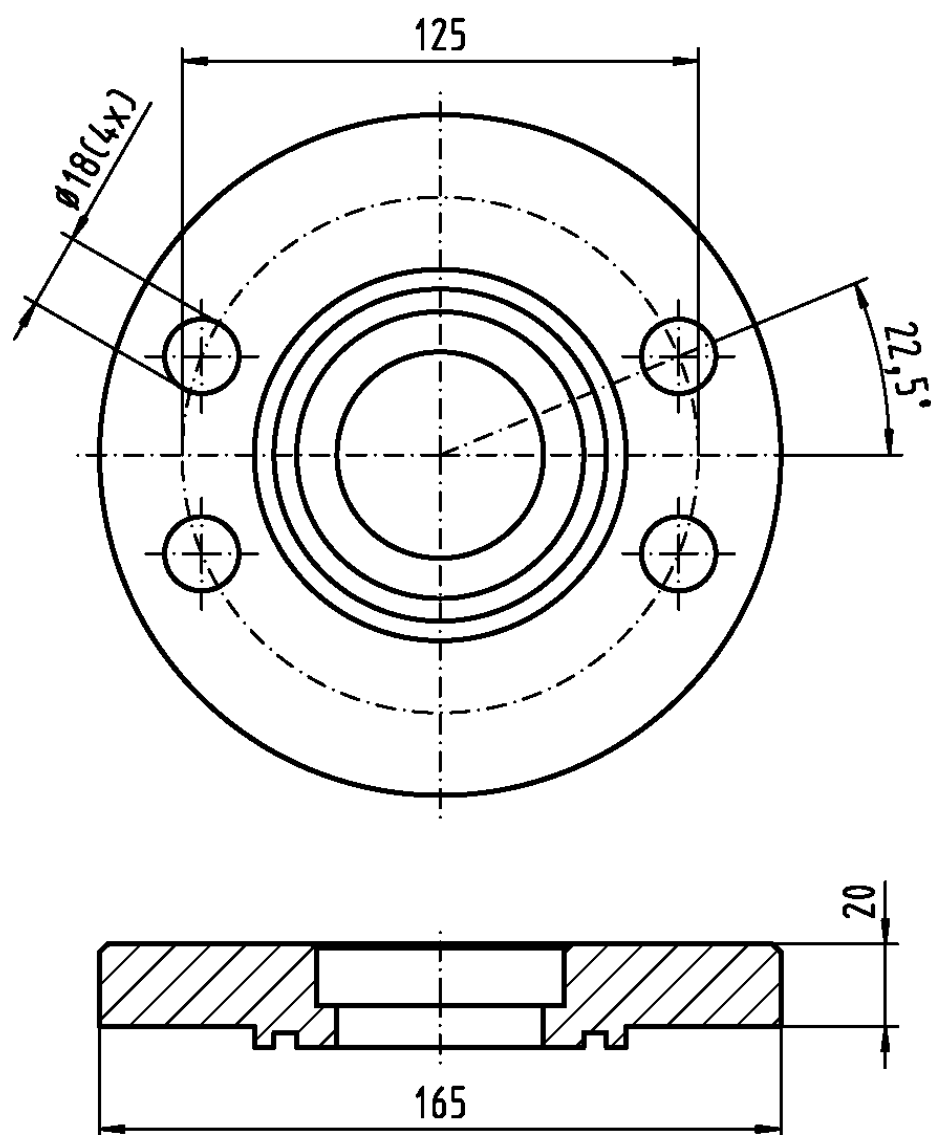
Dimensions [mm]	Width	Depth	Height
MPV	260	140 (160)	345

9.5.5 Dimensions of the Manual Leakage Compensator

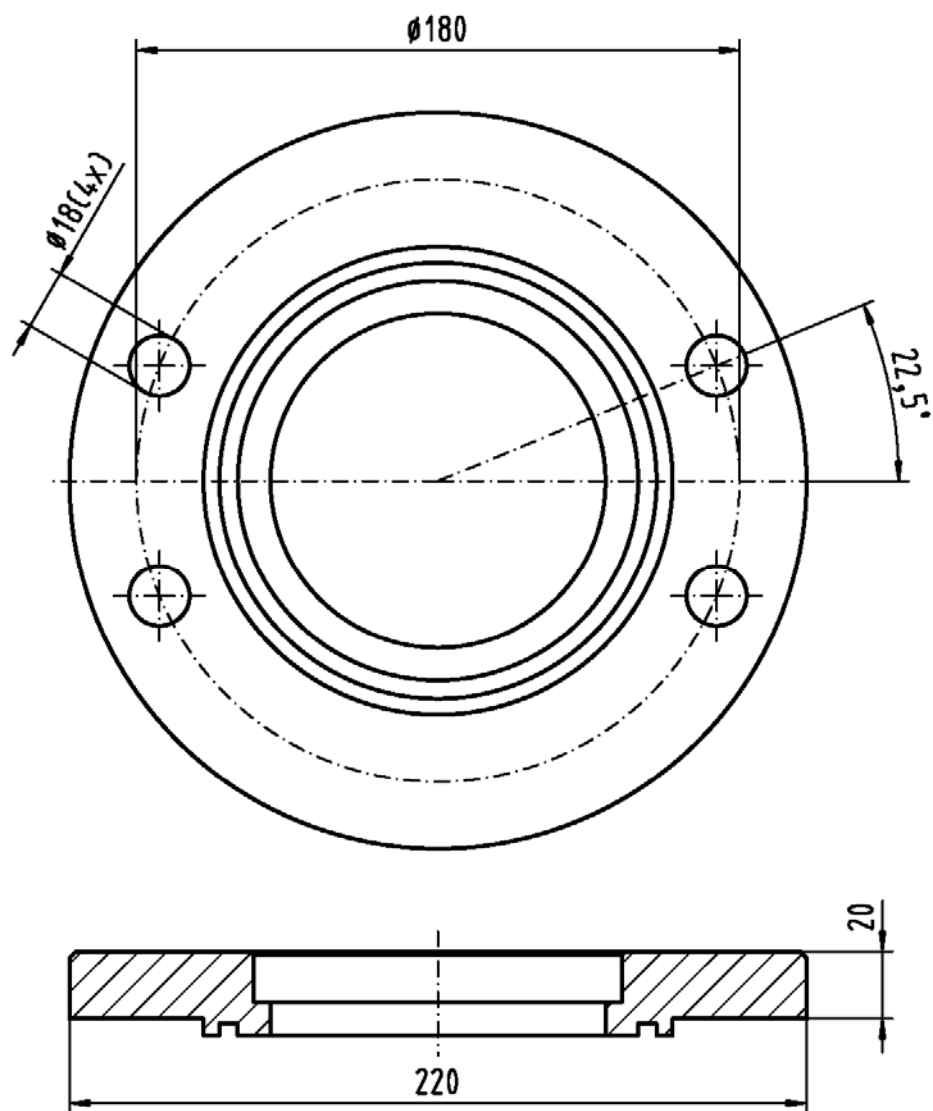


Dimensions [mm]	Width	Depth	Height
Manual leakage compensator	400	400	250

9.5.6 Dimensions of the Connection Flange MPV 2



9.5.7 Dimensions of the Connection Flange MPV 3



10 Order Numbers

10.1 Motor Purge Control System MPC

10.1.1 Motor Purge Controller 2G

Type No.	07	-	3711-6210	/	.	M	.	.
Character No.	A				B	C	D	E

Character	Character for :	<u>Variant:</u>	<u>Description</u>
A	Ex p control motor	07-3711-6210	for Ex Zone 1
B	Supply voltage	1	AC 230 V
		2	AC 115 V
C	Motor purge controller	M	
D	Rate of flow	2	0-180 m ³
		3	0-450 m ³
E	Versions for ambient temperatures	0	-20 °C to +40 °C
		5	-20 °C to +45 °C
		7	-30 °C to +50 °C

10.1.2 Motor Purge Controller 3G

Type No.	A7	-	3711-6110	/
Character No.	A				B	C	D	E

Character	Character for :	<u>Variant:</u>	<u>Description</u>
A	Ex p control motor	A7-3711-6110	for Ex Zone 2
B	Supply voltage	1	AC 230 V
		2	AC 115 V
C	Motor purge controller	M	
D	Rate of flow	2	0-180 m ³
		3	0-450 m ³
E	Versions for ambient temperatures	0	-20 °C to +40 °C
		5	-20 °C to +45 °C
		7	-30 °C to +50 °C

10.2 MPV Pressure Monitor Module

Type No.	17	-	51P3	/	3	.	0	3
Character No.	A				B	C	D	

Character	Character for:	<u>Variant:</u>	<u>Description</u>
A	Pressure monitor	17-51P2	for Ex p control stations
B	Version	3	valve-controlled
C	Measuring orifice	8	MPV 2, 0-180 m³
		9	MPV 3, 0-450 m³
D	Variant	03	at the Ex p enclosure

10.3 Control Unit for MPC

Type No.	07	-	3711-1200	/
Character No.	A				B	C		

Character	Character for:	<u>Variant:</u>	<u>Description</u>
A	Ex p control station	07-3711-1200	Ex p control unit
B	Power supply	1	AC 230 V
		2	AC 115 V
C	Motor Purge Controller	009	Control unit for standard and extended ambient temperatures
		139	Control unit for MPC HT

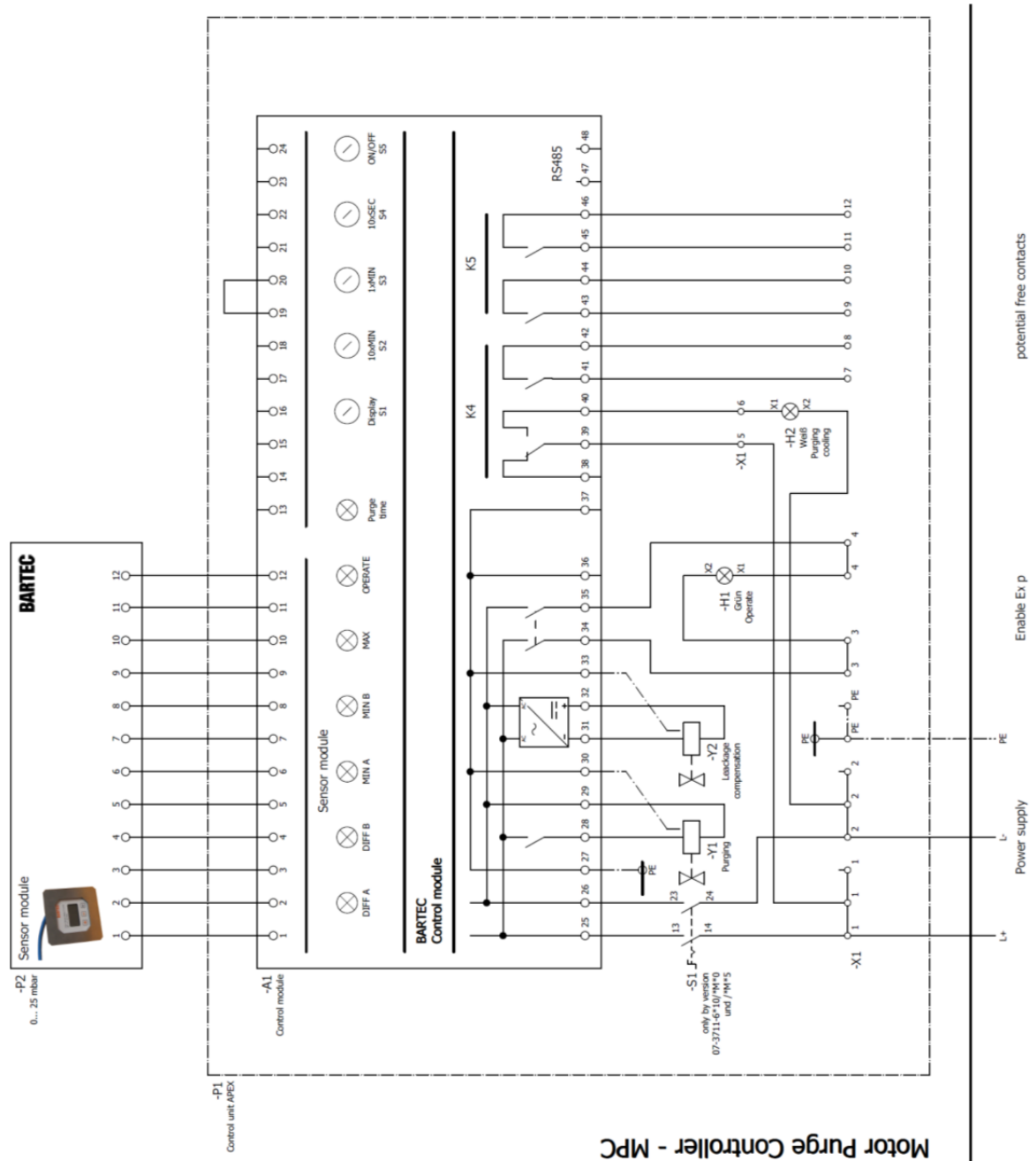
10.4 Manual Leakage Compensation

Type No.	05	-	0056	-	0	0	6	9
Character No.	A							

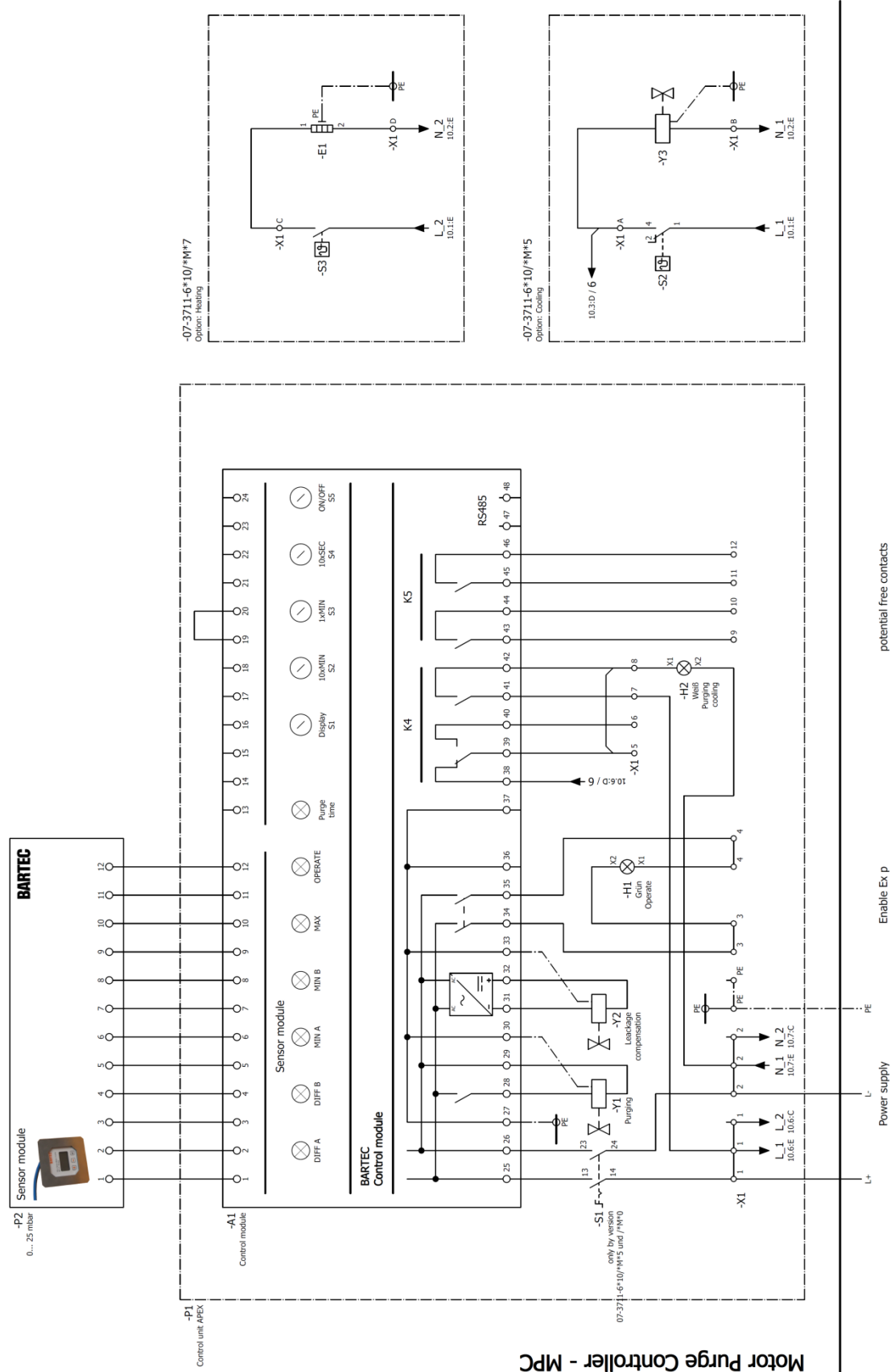
<u>Character</u>	<u>Character for:</u>	<u>Description</u>
A	Leakage compensation	G1" connection, input and output

11 Appendix

11.1 Wiring Diagram Motor Purge Controller



11.2 Wiring Diagram Motor Purge Controller (with Cooling / and Heating)



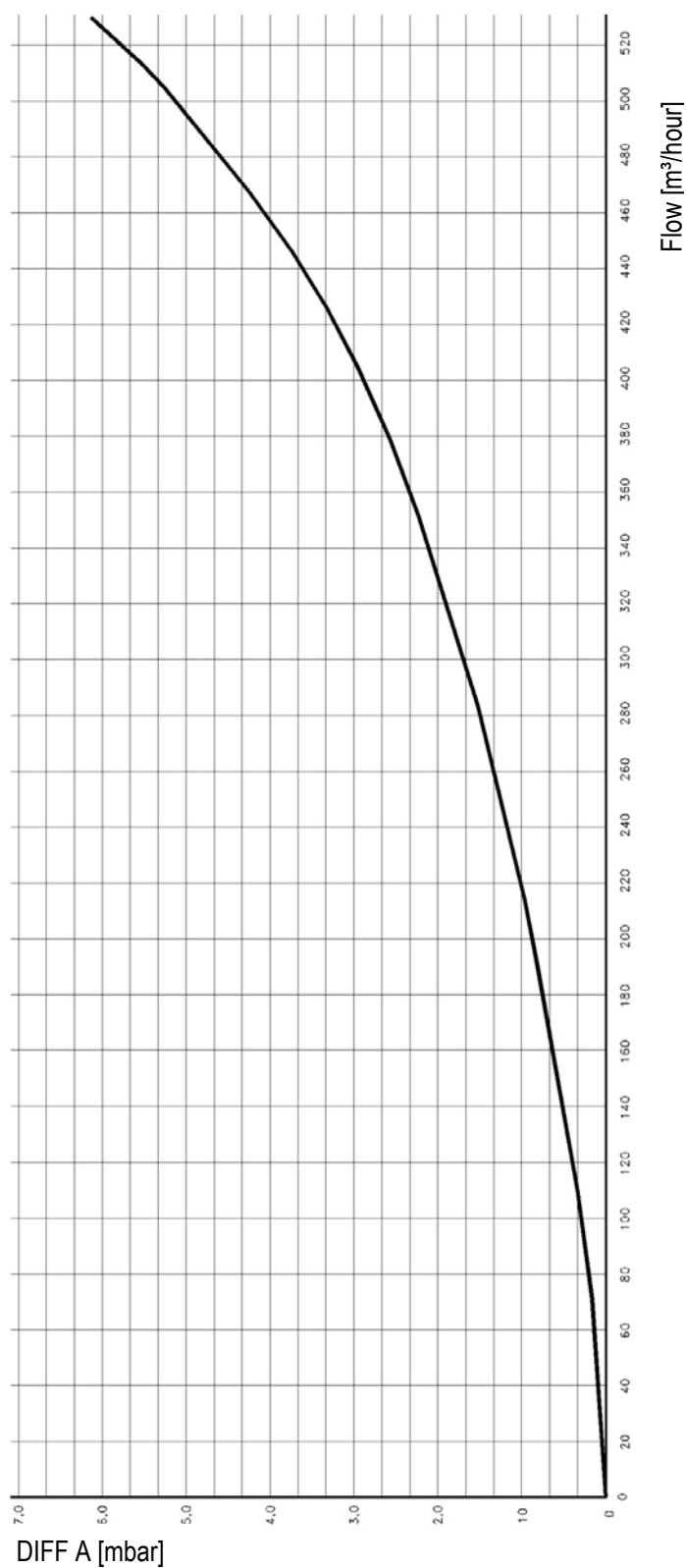
11.3 Purge Air Curve MPC S2

Purge air curve does not take account of any leakage losses!





11.4 Purge Air Curve MPC S3

Purge air curve does not take account of any leakage losses!






11.5 Marking on the Motor Purge Control System



11.5.1 Marking on the Motor Purge controller MPC – Standard 2G Variant

 0044	BARTEC 97980 Bad Mergentheim Germany
Motor Purge Controller MPC	
Type 07-3711-6210/*M*0	
DMT 99 ATEX E 082	
 II2 (1) G	Pressure range: 0 till 25 mbar
Ex de ib [ia Ga px] IIC T4 Gb	PS: AC *** V ± 10% 50-60 Hz
IECEx BVS ***	Prod. ID: ***
-20 °C ≤ Ta ≤ +40 °C	Prod. Date: **/**
Electrical data: see verification certificate	

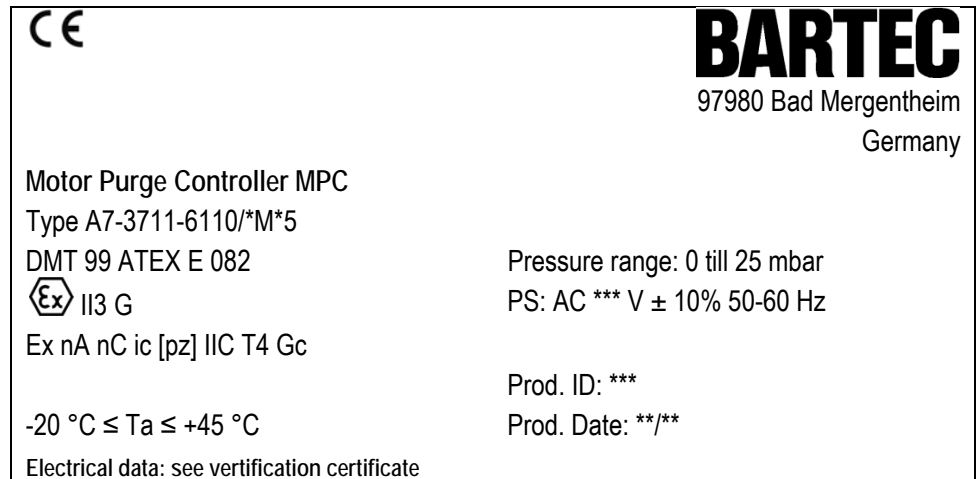
11.5.2 Marking on the Motor Purge Controller MPC –3G Standard Variant

	 97980 Bad Mergentheim Germany
Motor Purge Controller MPC	
Type A7-3711-6110/*M*0	
DMT 99 ATEX E 082	
 II3 G	Pressure range: 0 till 25 mbar
Ex nA nC [ic pz] IIC T4 Gc	PS: AC *** V \pm 10% 50-60 Hz
	Prod. ID: ***
	Prod. Date: **/**
-20 °C \leq Ta \leq +40 °C	
Electrical data: see verification certificate	

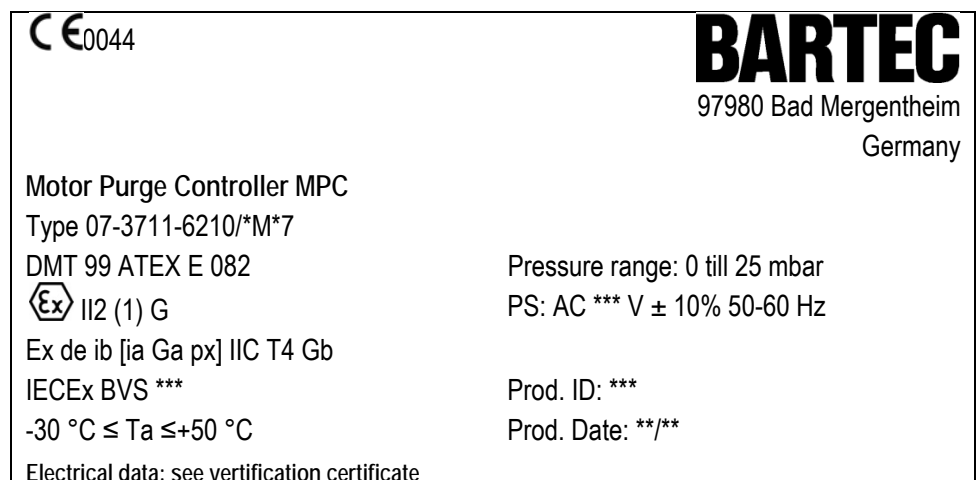
11.5.3 Marking on the Motor Purge Controller MPC – Extended Ambient Temperature 2G Variant

 0044	BARTEC 97980 Bad Mergentheim Germany
Motor Purge Controller MPC	
Type 07-3711-6210/*M*5	
DMT 99 ATEX E 082	
 II2 (1) G	Pressure range: 0 till 25 mbar
Ex de ib [ia Ga px] IIC T4 Gb	PS: AC *** V ± 10% 50-60 Hz
IECEX BVS ***	Prod. ID: ***
-20 °C ≤ Ta ≤ +45 °C	Prod. Date: **/**
Electrical data: see verification certificate	

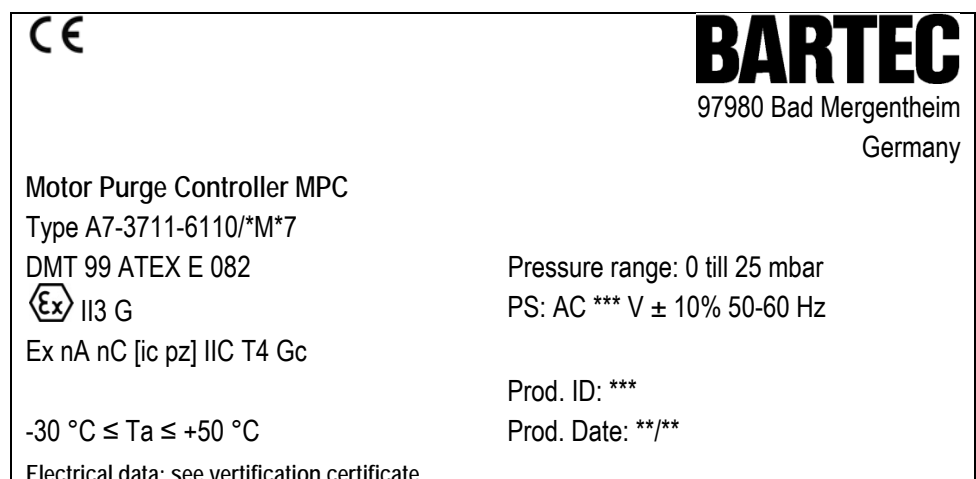
11.5.4 Marking on the Motor Purge Controller MPC – Extended Ambient Temperature 3G Variant



11.5.5 Marking on the MPC Motor Purge Controller –HT 2G Variant



11.5.6 Marking on the MPC Motor Purge Controller –HT 3G variant

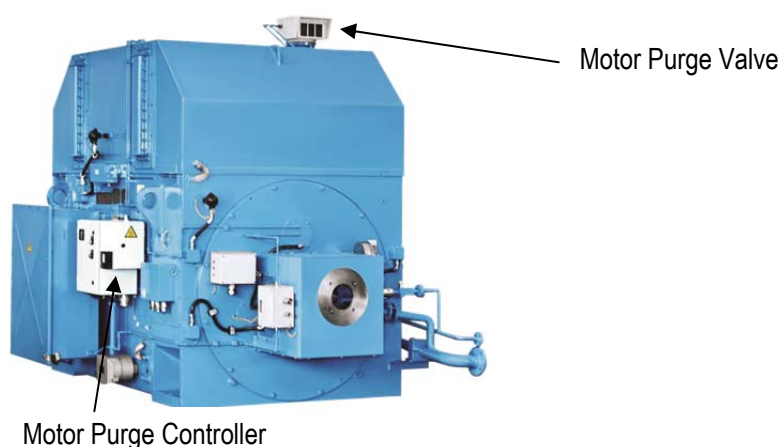


11.6 Brief Description of the Motor Purge Control System (for Owners/Managing Operators)

11.6.1 Basic Information

It is essential to read through the operating manual for the Ex p system carefully before connecting and starting the Ex p motor. The Ex p system is inspected, tested and set by the manufacturer of the entire system (Ex p motor with Ex p monitoring system). The parameters are recorded in the relating test documentation. The integration of the Ex p system into a process control system is the responsibility of the owner/managing operator of the entire system.

11.6.2 Positioning of the Ex p System on a Motor



11.6.3 Connections

11.6.3.1 Electrical Consumers

All internal components are supplied through terminals 1 and 2. The Ex p purge system is produced with AC 230 V as standard. AC 115 V is available as an option.

Variant	System	Ambient Temperature	Cooling	Heating
Standard	MPC + MPV	-20 °C to +40 °C	-	-
Extended Ta	MPC C + MPV	-20 °C to +45 °C	X	-
High Temperature	MPC HT + MPV	-30 °C to +50 °C	X	X

11.6.3.2 Electrical Connections for the Owner/Managing Operator

	Terminal	Designation
	1	L – Feed
	2	N – Feed
	3	L' - Enabling
	4	N' - Enabling
	7	K4 – Purging – N/O contact
	8	K4 – Purging – N/O contact
	9	K5 relay – freely programmable
	10	K5 relay – freely programmable
	11	K5 relay – freely programmable
	12	K5 relay – freely programmable

11.6.3.3 Description of the Electrical Connections

Terminal 1 / 2:

Voltage supply to the Ex p purge systems

Terminal 3 / 4:

Enabling for motor start and operation

Operating conditions at terminals 3 and 4

- a) No output voltage at terminals 3 and 4
→ No enabling for motor start and operation. H1 "OPERATE" lamp off
- b) Output voltage at terminals 3 and 4
→ Enabling for motor start and operation. H1 "OPERATE" lamp on

Terminal 7 / 8:

Purge time

Operating conditions at terminals 7 and 8

- a) Purge operation → H2 "PURGING" lamp on
- b) Purge operation concluded → H2 "PURGING" lamp off

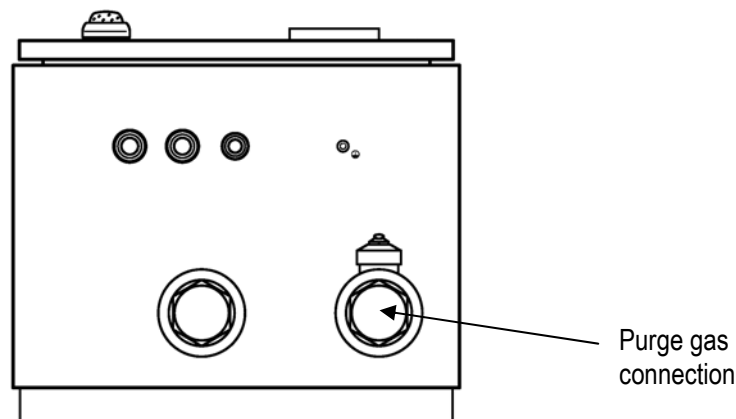
Terminal 9 / 10 / 11 / 12:

Floating relay, freely programmable.

Standard setting → switches simultaneously with enabling

To alter the setting, please refer to the Chapter 5.7 in the operating instructions

11.6.3.4 Air Connection by the Customer



Variant	Thread Size
MPC S2	G 1"
MPC S3	G 1 1/2"

12 Declarations of Conformity and Approvals

12.1 EC Declaration of Conformity for the Motor Purge Control System 2G

Erklärung der Konformität
Declaration of Conformity
Attestation de conformité

Nº 01-3711-7C0003

BARTEC

BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany



Wir	We	Nous
BARTEC GmbH,		
erklären in alleiniger Verantwortung, dass das Produkt	declare under our sole responsibility that the product	attestons sous notre seule responsabilité que le produit
Motor Purge Control System – MPC		

07-3711-62**/*M**

auf das sich diese Erklärung bezieht den Anforderungen der folgenden Richtlinien (RL) entspricht	to which this declaration relates is in accordance with the provision of the following directives (D)	se référant à cette attestation correspond aux dispositions des directives (D) suivantes
ATEX-Richtlinie 94/9/EG	ATEX-Directive 94/9/EC	ATEX-Directive 94/9/CE
EMV-Richtlinie 2004/108/EG	EMC-Directive 2004/108/EC	CEM-Directive 2004/108/CE.
und mit folgenden Normen oder normativen Dokumenten übereinstimmt	and is in conformity with the following standards or other normative documents	et est conforme aux normes ou documents normatifs ci-dessous
EN 60079-0:2012 EN 60079-1:2007 EN 60079-2:2007 EN 60079-7:2007	EN 60079-11:2012 EN 60079-26:2007 EN 61000-6-2:2005 EN 61000-6-4:2007 +A1:2011	DIN EN ISO 61511-1:2005 DIN EN ISO 61511-2:2005 EN 60529:1991 + A1:2000

Kennzeichnung	Marking	Marquage
II 2(1) G Ex de ib [ia Ga px] IIC T4 Gb		
Verfahren der EG-Baumusterprüfung / Benannte Stelle	Procedure of EC-Type Examination / Notified Body	Procédure d'examen CE de type / Organisme Notifié

DMT 99 ATEX E 082
0158, DEKRA EXAM, Dinnendahlstrasse 9, 44809 Bochum, D
CE 0044

Bad Mergentheim, den 27.05.2013

ppa. Ewald Warmuth
Geschäftsleitung / General Manager

12.2 EC Declaration of Conformity for the Motor Purge Control System 3G

Erklärung der Konformität
Declaration of Conformity
Attestation de conformité

Nº A1-3711-7C0001_A

BARTEC
BARTEC GmbH
Max-Eyth-Straße 16
97980 Bad Mergentheim
Germany



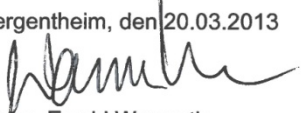
Wir	We	Nous
BARTEC GmbH,		
erklären in alleiniger Verantwortung, dass das Produkt	declare under our sole responsibility that the product	attestons sous notre seule responsabilité que le produit
Motor Purge Control System MPC		

Typenbezeichnung : A7-3711-6110/*M**

auf das sich diese Erklärung bezieht den Anforderungen der folgenden Richtlinien (RL) entspricht	to which this declaration relates is in accordance with the provision of the following directives (D)	se référant à cette attestation correspond aux dispositions des directives (D) suivantes
ATEX-Richtlinie 94/9/EG	ATEX-Directive 94/9/EC	ATEX-Directive 94/9/CE
EMV-Richtlinie 2004/108/EG	EMC-Directive 2004/108/EC	CEM-Directive 2004/108/CE.
und mit folgenden Normen oder normativen Dokumenten übereinstimmt	and is in conformity with the following standards or other normative documents	et est conforme aux normes ou documents normatifs ci-dessous
EN 60079-0:2012 EN 60079-2:2007 EN 60079-11:2011	EN 60079-15:2005 EN 60529:1991+A1:2000	EN 61000-6-2:2005 EN 61000-6-4:2007 +A1:2011
Kennzeichnung	Marking	Marquage
Ⓔ II 3G Ex nA nC [ic pz] IIC T4 Gc		
Verfahren der internen Fertigungskontrolle	Procedure of internal control of Production	Procédure de contrôle interne de fabrication



Bad Mergentheim, den 20.03.2013


ppa. Ewald Warmuth
Geschäftsleitung / General Manager

03-0383-0289

12.3 EC Type Examination Certificate for the Motor Purge Control System 2G



Translation

(1) 3. Supplement to the EC-Type Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC Supplement accordant with Annex III number 6
- (3) No. of EC-Type Examination Certificate: **DMT 99 ATEX E 082**
- (4) Equipment: **Control unit APEX 2003 type 07-3711-2**/******
- (5) Manufacturer: **BARTEC GmbH**
- (6) Address: **Max-Eyth-Str. 16, 97980 Bad Mergentheim, Germany**
- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.
- (8) The certification body of DEKRA EXAM GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the test and assessment report BVS PP 99.2107 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:
- | | |
|------------------|--|
| EN 60079-0:2012 | General requirements |
| EN 60079-1:2007 | Flameproof enclosure "d" |
| EN 60079-2:2007 | Pressurized enclosure "p" |
| EN 60079-7:2007 | Increased safety "e" |
| EN 60079-11:2012 | Intrinsic safety "i" |
| EN 60079-26:2007 | Equipment with equipment protection level (EPL) Ga |
- | | |
|-------------------------|---|
| DIN EN ISO 61511-1:2005 | Safety instrumented systems for the process industry sector |
| DIN EN ISO 61511-2:2005 | Safety instrumented systems for the process industry sector |
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this certificate.
- (11) This supplement to the EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.
- (12) The marking of the equipment shall include the following:

 **II 2(1)G Ex de ib [ia Ga px] IIC T6/T4 Gb**
or
II 2(1)G Ex de [ia Ga px] IIC T6 Gb

DEKRA EXAM GmbH
Bochum, dated 26th march 2013

Signed: Dr. Eickhoff

Certification body

Signed: Dr. Wittler

Special services unit

Page 1 of 5 to: DMT 99 ATEX E 082 / N3
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(13) Appendix to

(14) **3. Supplement to the EC-Type Examination Certificate**
DMT 99 ATEX E 082

(15) 15.1 Subject and type

Control unit APEX 2003 type 07-3711-*2**/****

Asterisk	Description
1	Variant
1	Control unit APEX 2003.00, standard version Marking: Ex de ib [ia px Ga] IIC T4/T6 Gb (Temperature class depends on sensor module installed) Ex de [ia px Ga] IIC T6 Gb (at off-set sensor module)
2	Control unit APEX 2003.MV, version with one solenoid valve at intake of protective gas Marking: Ex de ib [ia px Ga] IIC T4 Gb
3	Control unit APEX 2003.SI/B, with one solenoid valve each at intake and outtake of protective gas Marking: Ex de ib [ia px Ga] IIC T4 Gb
4	As type 07-3711-32../....., but equipped with flow-through nozzle for continuous purging Marking: Ex de ib [ia px Ga] IIC T4 Gb
6	Motor purge control system (MPC) Control unit for purging large Ex p motors
2	Sensor module
0	external
1	0 ... 25 mbar
2	0 ... 300 mbar
3	0 ... 1000 mbar
3	Without influence to the explosion protection
4	Rated voltage
1	AC 230 V
2	AC 115 V
4	DC 24 V
5-7	Without influence to the explosion protection

15.2 Description

The control unit APEX 2003 type 07-3711-*2**/**** is designed to build up an explosion proof electrical equipment in type of protection Pressurized Enclosure, that will be certified separately.

The control electronic type 17-5522-*2*1/**** that is part of the complete control unit type 07-3711-*2**/**** is built in into a separately certified enclosure according to PTB 97 ATEX 1066 U in type of protection Flameproof Enclosure. That flameproof enclosure is built in into a separately certified enclosure in type of protection Increased Safety. Inside the surrounding enclosure in type of protection Increased Safety are also mounted separately certified sensor modules and other certified equipment. The sensor module type 17-51P2-****/**** according to DMT 99 ATEX E 108 X can optionally be mounted separately to the surrounding enclosure.

Page 2 of 5 to DMT 99 ATEX E 082 / N3

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The functional safety of the control unit APEX 2003 type 07-3711-2**/**** is tested according to DIN EN ISO 61511-1 and DIN EN ISO 61511-2 "Safety instrumented systems for the process industry sector". The control unit – within its scope of functionality – is suitable for use in safety functions up to a safety integrity level SIL 2. This does apply to the "high demand mode of operation". The software version considered here was 2.15C58 of 08/2006.

Functional safety was investigated for ambient temperatures up to 40 °C. To ensure functional safety for the unit APEX 2003 type 07-3711-62**/**** and ambient temperatures up to 50 °C the described cooling measures are necessary not to exceed the internal housing temperature of 40 °C. The proper working of the cooling measures is indicated and is tested annually.

The motor purge control system consists of the control unit APEX 2003 with all non-electrical components which are built into or onto an enclosure.

Reason for this supplement is the update to the current standards, a new variant with rated voltage DC 24 V and the change of the ambient temperature.

15.3 Parameters

Electrical ratings

Supply voltage (terminal 25 and 26)

Control electronic type 17-5522-12*1/****	Rated voltage	AC	230	V
	Max. voltage U_m	AC	253	V
Control electronic type 17-5522-22*1/****	Rated voltage	AC	115	V
	Max. voltage U_m	AC	127	V
Control electronic type 17-5522-42*1/****	Rated voltage	DC	24	V
	Max. voltage U_m	DC	26	V

Supply voltage for Ex p (terminal 34 and 35)

A welding of the relay contacts will be avoided by use of an external fuse (e.g. 5 A, 1500 A breaking capacity, fast, according to IEC 60127-2)

Control electronic type 17-5522-12*1/****	Rated voltage	AC	230	V
	Switching current $(\cos \varphi \geq 0.7)$	Up to	4	A
	Switching current $(\cos \varphi = 1)$	Up to	5	A
Control electronic type 17-5522-22*1/****	Rated voltage	AC	115	V
	Switching current $(\cos \varphi \geq 0.7)$	Up to	4	A
	Switching current $(\cos \varphi = 1)$	Up to	5	A
Control electronic type 17-5522-42*1/****	Rated voltage	DC	24	V
	Switching current	Up to	5	A

Data lines Ex p (terminal 38 up to 46)

Switching voltage	Up to	AC	250	V
	Up to	DC	80	V
Switching current	Up to		500	mA

Inlet valve (terminal 31 and 32)

Control electronic type	Rated voltage [VDC]	Max. voltage [VDC]	Rated power [W]
17-5522-1211/****	230	358	7
17-5522-1221/****	230	358	9
17-5522-1231/****	230	358	15
17-5522-2211/****	115	179	7
17-5522-2221/****	115	179	9
17-5522-2231/****	115	179	15
17-5522-4211/****	24	24	7
17-5522-4221/****	24	24	9
17-5522-4231/****	24	24	15



Outlet valve (terminal 28 and 29)

Control electronic type	Rated voltage	Nominal current of fuse [mA]
17-5522-1211/****	230 VAC	80
17-5522-1221/****	230 VAC	100
17-5522-1231/****	230 VAC	100
17-5522-2211/****	115 VAC	160
17-5522-2221/****	115 VAC	200
17-5522-2231/****	115 VAC	200
17-5522-4221/****	24 VDC	1000
17-5522-4231/****	24 VDC	1000

RS485 (terminal 47 and 48)

Voltage	U _m	±	12	V
Max. voltage	Up to	AC/DC	253	V
Current			250	mA

Temperature sensor in type of protection Ex ia IIC (terminal 15 and 16)

Voltage	U ₀	DC	7.5	V
Current	I ₀		10	mA
Power	P ₀		20	mW
Linear output characteristics				
Max. external inductivity	L ₀		330	mH
Max. external capacity	C ₀		11	µF

Intrinsic safe output terminals in type of protection Ex ia IIC

External overpressure switch (terminal 13 and 14),

Key switch (terminal 17 and 18),

On / Off switch (terminal 19 and 20) and

Enabling bridge for parameterisation (terminal 23 and 24)

Voltage	U ₀	DC	7.5	V
Current	I ₀		50	mA
Power	P ₀		95	mW
Linear output characteristics				
Max. external inductivity	L ₀		14	mH
Max. external capacity	C ₀		11	µF

External overpressure sensor (terminal 21 and 22)

Voltage	U ₀	DC	30	V
Current	I ₀		100	mA
Power	P ₀		750	mW
Linear output characteristics				
Max. external inductivity	L ₀		3	mH
Max. external capacity	C ₀		66	nF

Terminals of sensor module type 17-51P2-****/**** according to DMT 99 ATEX E 108 X

Supply circuit 1 (terminal 7 and 8)

Voltage	U ₀	DC	30	V
Current	I ₀		100	mA
Power	P ₀		750	mW
Max. external inductivity	L ₀		3	mH
Max. external capacity	C ₀		66	nF

Data circuit 1 (terminal 2 up to 6, 9, 11 and 12)

Voltage	U ₀	DC	7.5	V
Current	I ₀		50	mA
Power	P ₀		95	mW
Linear output characteristics				
Max. external inductivity	L ₀		14	mH
Max. external capacity	C ₀		11	µF

Data circuit 2 (terminal 1 and 10)

Voltage	U ₀	DC	-7.5	V
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Data circuit 2 (terminal 1 and 10)

Voltage	U_0	DC	-7.5	V
Current	I_0		10	mA
Power	P_0		20	mW
Linear output characteristics				
Max. external inductivity	L_0		330	mH
Max. external capacity	C_0		11	μ F

Continuous flow rate depends on controlled minimum overpressure:

Minimum overpressure	Continuous flow rate
100 Pa	0.45 l/min
200 Pa	0.8 l/min
300 Pa	1.3 l/min
400 Pa	1.7 l/min
500 Pa	2.1 l/min

Thermal ratings

Type	Temperature range
07-3711-12**/****	-20 °C ... +40 °C (T6, T4)
07-3711-12**/**** with additional cooling	-20 °C ... +50 °C (T4)
07-3711-22**/****	-20 °C ... +40 °C
07-3711-32**/****	-20 °C ... +40 °C
07-3711-42**/****	-20 °C ... +40 °C
07-3711-62**/**** standard	-20 °C ... +40 °C (T4)
07-3711-62**/**** with additional cooling	-20 °C ... +45 °C
07-3711-62**/**** with Intertec enclosure	-30 °C ... +50 °C

Inert gas or air ratings

Maximum temperature	+40 °C
Maximum pressure	3 bar

(16) Test and assessment report

BVS PP 99.2107 EG as of 26th March 2013

(17) Special conditions for safe use

None

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.


DEKRA EXAM GmbH
44809 Bochum, 26th march 2013
BVS-Schu/Ma A 20120973

Certification body

Special services unit

12.4 IECEx Certificate of Conformity Motor Purge Control System 2G

		IECEx Certificate of Conformity	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres <small>for rules and details of the IECEx Scheme visit www.iecex.com</small>			
Certificate No.:	IECEx BVS 13.0039	Issue No.: 0	Certificate history:
Status:	Current		
Date of Issue:	2013-03-21	Page 1 of 4	
Applicant:	Bartec GmbH Max-Eyth-Strasse 16 97980 Bad Mergentheim Germany		
Electrical Apparatus: Optional accessory:	Control Unit APEX 2003 Type 07-3711-*2**/****		
Type of Protection:	Equipment protection by flameproof enclosures "d", Equipment protection by intrinsic safety "i", Equipment protection by pressurized enclosure "p", Equipment with equipment protection level (EPL) Ga, Equipment protection by increased safety "e"		
Marking:	Ex de ib [ia Ga px] IIC T6/T4 Gb or Ex de [ia Ga px] IIC T6 Gb		
Approved for issue on behalf of the IECEx Certification Body:	Dr. F. Eickhoff		
Position:	Deputy Head of Certification Body		
Signature: (for printed version)			
Date:	2013-03-21		
<small>1. This certificate and schedule may only be reproduced in full. 2. This certificate is not transferable and remains the property of the issuing body. 3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.</small>			
Certificate issued by:			
DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany			
 DEKRA EXAM GmbH			

		<h2 style="text-align: center;">IECEx Certificate of Conformity</h2>	
Certificate No.:	IECEx BVS 13.0039		
Date of Issue:	2013-03-21	Issue No.:	0
		Page	2 of 4
Manufacturer:	Bartec GmbH Max-Eyth-Strasse 16 97980 Bad Mergentheim Germany		
Additional Manufacturing location (s):			
<p>This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.</p>			
STANDARDS: The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:			
IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements		
IEC 60079-1 : 2007-04 Edition: 6	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"		
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"		
IEC 60079-2 : 2007-02 Edition: 5	Explosive Atmospheres - Part 2 Equipment protection by pressurized enclosure "p"		
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga		
IEC 60079-7 : 2006-07 Edition: 4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"		
<p><i>This Certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.</i></p>			
TEST & ASSESSMENT REPORTS: A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in			
<u>Test Report:</u> DE/BVS/ExTR13.0040/00			
<u>Quality Assessment Report:</u> DE/TUN/QAR06.0017/04			



IECEx Certificate of Conformity

Certificate No.: IECEX BVS 13.0039

Date of Issue: 2013-03-21

Issue No.: 0

Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Subject and type

Control unit APEX 2003 type 07-3711-*2**/*

Asterisk Description

- | | | |
|-----|---|------------------------------------|
| 1 | Variant | |
| | 1 | : Standard |
| | 6 | : Motor purge control system (MPC) |
| 2 | Sensor module | |
| | 0 | : external |
| | 1 | : 0 ... 25 mbar |
| | 2 | : 0 ... 300 mbar |
| | 3 | : 0 ... 1000 mbar |
| 3 | Without influence to the explosion protection | |
| 4 | Rated voltage | |
| | 1 | : AC 230 V |
| | 2 | : AC 115 V |
| | 4 | : DC 24 V |
| 5-7 | Without influence to the explosion protection | |

CONDITIONS OF CERTIFICATION: NO



IECEx Certificate of Conformity

Certificate No.: IECEx BVS 13.0039

Date of Issue: 2013-03-21

Issue No.: 0

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EQUIPMENT(continued):

Description

The control unit APEX 2003 type 07-3711-*2**/**** is designed to built up an explosion proof electrical equipment in type of protection Pressurized Enclosure, that will be certified separately.

The control electronic type 17-5522-*2*1/**** that is part of the complete control unit type 07-3711-*2**/**** is built in into a separately certified enclosure according to IECEx PTB 11.0082U in type of protection Flameproof Enclosure. That flameproof enclosure is built in into a separately certified enclosure in type of protection Increased Safety. Inside the surrounding enclosure in type of protection Increased Safety are also mounted separately certified sensor modules and other certified equipment. The sensor module type 17-51P2-*2**/**** according to IECEx BVS 09.0055X can optionally be mounted separately to the surrounding enclosure.

The functional safety of the control unit APEX 2003 type 07-3711-*2**/**** is tested according to DIN EN ISO 61511-1 and DIN EN ISO 61511-2 "Safety instrumented systems for the process industry sector". The control unit fulfils the requirements of category 3 of the standards. Functional safety was investigated for ambient temperatures up to 40 °C. To ensure functional safety for the unit APEX 2003 type 07-3711-62**/**** and ambient temperatures up to 50 °C the described cooling measures are necessary not to exceed the internal housing temperature of 40 °C. The proper working of the cooling measures is indicated and is tested annually.

The motor purge control system consists of the control unit APEX 2003 with all non electrical components which are built into or onto an enclosure.

Ratings

See Annex

Annexe: BVS_13_0039_Bartec_Annex.pdf

BARTEC protects
people and
the environment
by the safety

of components,
systems
and plants.

